



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

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### Memorandum

To: Field Manager, Bureau of Land Management, Buffalo Field Office, Buffalo, Wyoming

From: Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne, Wyoming

Subject: Final Biological and Conference Opinion for the Powder River Basin Oil and Gas Project, Campbell, Converse, Johnson, and Sheridan Counties, Wyoming (Formal Consultation No. ES-6-WY-02-F006)

This document transmits the U. S. Fish and Wildlife Service's (Service) Biological and Conference Opinion based on our review of the proposed Powder River Basin Oil and Gas Project located in Campbell, Converse, Johnson, and Sheridan Counties, Wyoming, and its effects on the bald eagle (*Haliaeetus leucocephalus*), mountain plover (*Charadrius montanus*), and Ute ladies'-tresses orchid (*Spiranthes diluvialis*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your December 9, 2002, request for formal consultation was received in the Wyoming Field Office on December 10, 2002.

This Biological and Conference Opinion is based on information provided in the December 2001 Biological Assessment (BA); the January 2002, *Draft Environmental Impact Statement and Draft Planning Amendment for the Powder River Basin Oil and Gas Project* (DEIS); the September 3, 2002, Final Biological Assessment (FBA); and numerous telephone conversations and meetings with personnel for the Bureau of Land Management's (Bureau) Buffalo, Mile City, and Billings Field Offices, the Service's Montana and Wyoming State Offices regarding coal bed methane development in Montana and Wyoming. A *Preliminary Final Environmental Impact Statement and Draft Planning Amendment for the Powder River Basin Oil and Gas Project* (PFEIS) was provided to the Service on November 12, 2002. However, the *Final Environmental Impact Statement and Final Planning Amendment for the Powder River Basin Oil and Gas Project* (FEIS) was not available for use in developing this Biological and Conference Opinion because it is still undergoing final revision. Nevertheless, the FBA of September 3, 2002, contains a current and complete description of the project as it will appear in the FEIS, as well as information necessary to complete this consultation.

This Biological and Conference Opinion addresses the effects of 39,367 coal bed methane

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(CBM) wells, 3,200 conventional (i.e., non-CBM) oil and/or natural gas wells and associated facilities, including access roads, gas gathering and water disposal pipelines, electrical utilities, and production facilities (such as compressor stations, central delivery points, buildings and meters), pipelines to transport gas to high-pressure transmission lines, and facilities for treating, discharging, disposing of, containing, or injecting produced water, that will be developed on Federal surface lands and/or Federal minerals ownership. A complete administrative record of this consultation is on file at the Service's Wyoming Field Office, Cheyenne, Wyoming.

### **Consultation History**

Informal consultation on this project began with the Service's receipt of the Bureau's May 22, 2000, scoping notice for the development of additional CBM wells on Federal lands in the Powder River Basin, Wyoming. On June 5, 2001, the Service provided an updated species list for the Powder River Basin Oil and Gas Project. Formal consultation was initiated on January 30, 2002, with the Service's receipt of the Bureau's December, 2001, BA and DEIS. The Service acknowledged receipt of the BA on February 21, 2002, and informed the Bureau that the Service had the information required to initiate consultation or the information was otherwise accessible for our consideration and reference. The Service's Biological and Conference Opinion was due on June 13, 2002. Because of the national public interest in this project the Bureau extended the comment period on the DEIS to May 15, 2002. On May 30, 2002, the Service received a letter from the Bureau extending by 30 days the due date for the Biological and Conference Opinion. The Service provided a draft of this Biological and Conference Opinion to the Bureau's Buffalo Field Office on June 27, 2002. In the Bureau's letter of July 8, 2002, they requested the Service not finalize the Biological and Conference Opinion at that time, and that the Bureau would reinstate consultation in the near future when the FBA, and preferred alternative were finalized. Bureau and Service personnel from Wyoming and Montana met on July 25-26, 2002, in Billings, Montana and on August 8, 2002, in Buffalo, Wyoming. These meetings were to ensure a consistent approach to the identification of project effects and ways to minimize effects on endangered and threatened species identified in both this Biological and Conference Opinion and the Biological and Conference Opinion for the Coal Bed Methane Production in 16 Montana Counties. On August 26, 2002, the Bureau's Buffalo Field Office provided the Service with a draft FBA with changes to the Bureau's proposed mitigation measures. Coordination between the Service and the Bureau in late August and early September of 2002, resulted in agreement on the language of the final mitigation measures and Terms and Conditions to appear in the draft FBA. On September 3, 2002, the Bureau's Buffalo Field Office provided the Service with a FBA and requested reinitiation of formal section 7 consultation for the Powder River Basin Oil and Gas Project. The Bureau requested the Service prepare a Biological and Conference Opinion within 13 days. Additional coordination between the Service and the Bureau's State Office and Buffalo Field Office in early September 2002, provided agreement on how to address conflicting conservation measures designed to protect bald eagle roost sites. On September 16, 2002, the Service provided the Bureau with the requested draft Biological and Conference Opinion. Since September 16, 2002, the Service has not received any comments from the Bureau on this draft Biological and Conference Opinion.

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On November 12, 2002, the Bureau's Buffalo Field Office provided the Service with a PFEIS for our review and comment. On November 26, 2002, the Service provided comments on the PFEIS. On December 9, 2002, the Bureau, after deciding that Alternative 2A would be the preferred alternative in the FEIS, requested that the Service finalize the Biological and Conference Opinion and provide it to the Bureau by December 17, 2002.

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## **BIOLOGICAL AND CONFERENCE OPINIONS**

### **DESCRIPTION OF PROPOSED ACTION**

The Powder River Basin Oil and Gas Project is located in all or parts of Campbell, Converse, Johnson, and Sheridan counties, Wyoming, in the Powder River Basin. The proposed project includes the development of 39,367 CBM wells and 3,200 conventional (i.e., non-CBM) oil and/or natural gas wells on 26,000 well pads within a project area of almost 8,000,000 acres. The project also includes construction of associated facilities, including access roads, gas gathering and water disposal pipelines, electrical utilities, and production facilities (such as compressor stations, central delivery points, buildings and meters), facilities for treating, discharging, disposing of, containing, or injecting produced water, and pipelines to transport gas to high-pressure transmission lines.

The FBA and preferred alternative (2A) identifies an 80-acre well spacing pattern (8 wells or well pads per square mile). Each well pad would have one to three wells (one well per coal seam). Therefore, 8 well pads per section could result in 24 wells (well bores) drilled in each section. The potential short-term disturbance associated with CBM development during drilling and installation of facilities (up to 10 years) is estimated to be approximately 202,843 acres. Following reclamation of pipeline rights-of-way and partial reclamation of other facilities, the long-term disturbance (roads, well pads, etc.) associated with CBM development would be approximately 95,138 acres. Additional short-term and long-term disturbance associated with non-CBM wells and associated facilities is estimated to be approximately 8,803 acres and 7,520 acres, respectively.

Shallow well drilling rigs (truck mounted water well type drilling rigs) will be used for both drilling and completion activities. Each well will be drilled within an estimated 1 to 3 days. Well completion will occur within an additional 1 to 3 days. Well pads will not be leveled unless steep terrain can not be avoided. For producing wells, maintenance personnel may visit wells as often as once each day to ensure equipment is functioning properly. Two-track unimproved roads will be used for access to wells as topography and drainage allow. However, additional access will require the construction of 7,135 miles of improved roads.

Produced water will be piped away from the well sites and disposed of using a variety of methods depending on water quality, water volumes, and landowner desires. Proposed methods for the discharge will include: direct surface discharge into drainages; treatment of produced water followed by direct surface discharge; containment of produced water; and injection of produced water through disposal wells. An estimated maximum production rate of approximately 386,000 acre-feet per year of produced water will occur. The exact amount and location of each discharge will be determined during the application for a permit to drill process.

This biological and conference opinion is based on the effects presented in the FBA associated

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with a 80-acre well spacing with up to 3 wells (well bores) per pad (up to 24 wells drilled in each section). This Project should be re-analyzed and consultation re-initiated should a denser spacing of wells be planned or occur or, if additional wells per seam are required, and if new information reveals effects of the action in a manner or to an extent not considered initially.

### **Conservation Measures**

The Bureau has attempted to minimize some of the direct and indirect impacts of the project to listed and proposed species, as well as the habitats for these species by incorporating the following conservation measures into the proposed project. These measures (taken verbatim from the September 3, 2002, FBA and identified as “mitigation”) are as follows:

#### **Bald Eagle**

- CM1. In the event that a bald eagle (dead or injured) is located during construction or operation, the Service’s Wyoming Field Office (307- 772-2374) and the Service’s Law Enforcement Office (307-261-6365) will be notified within 24 hours.
- CM2. Site-specific project areas will be evaluated for suitable bald eagle nesting and roosting habitat prior to permit approval. Suitable nesting habitat is any mature stand of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes or any significant body of water. Suitable roosting habitat is defined as any mature stand of conifer or cottonwood trees.
- CM3. The Bureau shall monitor all take (*incidental*of bald eagle habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of the Bureau but can be delegated to the Bureau’s agent (consultant, contractor, etc). A written summary will be provided to the Service’s Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the FEIS for the Powder River Basin Oil and Gas Project and the Record Of Decision (ROD). The semi-annual reports will include all actions completed 30 days prior to the reporting dates. The first report will be due six months after the signing of the ROD and on the anniversary dates of the signing of the ROD. Reporting will continue for the life of the project.
- CM4. The Bureau shall monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads.
- CM5. All power lines would be built to protect raptors, including wintering bald eagles, from accidental electrocution using methods detailed by the Avian Power Line Interaction Committee (1996).

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- CM6. Special habitats for raptors, including wintering bald eagles, would be identified and considered during the review of the Application for Permit to Drill/Plan of Development (APD/POD) or Sundry Notices.
- CM7. Surveys for active bald eagle nests and winter roost sites will be conducted within suitable habitat by a Bureau-approved biologist. Surface disturbing activities will not be permitted within 1-mile of suitable habitat prior to survey completion.
- CM8. A minimum disturbance-free buffer zone of 0.5 mile (i.e., no surface occupancy) would be established year round for all bald eagle nests. A seasonal minimum disturbance-free buffer zone of 1-mile would be established for all bald eagle nest sites (February 1 - August 15).
- CM9. A seasonal minimum disturbance-free buffer zone of 1-mile would be established for all bald eagle winter roost sites (November 1 - April 1). These buffer zones and timing restrictions may be adjusted based on site-specific information through coordination with, and after written approval from the Service.
- CM10. Within 0.5 mile of bald eagle winter roost sites additional measures such as remote monitoring and restricting maintenance visitation to between 9:00 AM and 3:00 PM may be necessary to prevent disturbance (November 1 - April 1).
- CM11. Maximum design speed on all operator constructed and maintained roads shall not exceed 25 miles per hour to minimize the chance of a collision with a bald eagle, other wildlife, or livestock.
- CM12. Additional mitigation measures may be necessary if the site-specific project is determined by a Bureau biologist to have an adverse affect to bald eagles or their habitat.

Black-footed ferret

- CM13. Site-specific project areas will be evaluated for suitable black-footed ferret habitat prior to permit approval. Suitable habitat consists of a black-tailed prairie dog town or complex greater than 80 acres (USFWS 1989). A prairie dog town is a group of intact prairie dog holes whose density exceeds 8 burrows/acre; a complex consists of 2 or more neighboring prairie dog towns each less than 4.34 miles (7 kilometers) from the other (USFWS 1989).
- CM14. Prairie dog colonies will be avoided wherever possible.



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- CM15. If suitable prairie dog colonies cannot be avoided, surveys will be conducted in compliance with the Service's guidelines (USFWS 1989). The entire colony or complex affected will be surveyed, even if part of the colony has a burrow density below eight burrows per acre.
- CM16. If any black-footed ferrets are located, the Service will be consulted. Absolutely no disturbance will be allowed within prairie dog colonies inhabited by black-footed ferrets.
- CM17. Additional mitigation measures may be necessary if the site-specific project is determined by a Bureau biologist to have an adverse affect to black-footed ferrets or their habitat.

Ute ladies'-tresses

- CM18. At the discretion of the surface owner, native species would be planted to re-establish special habitats.
- CM19. Site-specific project areas will be evaluated for suitable Ute ladies'-tresses orchid habitat prior to permit approval. Suitable habitat is characterized by moist soils near springs, lakes, or perennial streams; most occurrences are in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows in the floodplains of perennial streams (USFWS 1995).
- CM20. Suitable habitat will be avoided wherever possible.
- CM21. If suitable habitat for Ute ladies'-tresses cannot be avoided, surveys will be conducted in compliance with the Service's guidelines (USFWS 1995) by a Bureau-approved biologist or botanist. Be aware, surveys can only be conducted between July 20 and August 31.
- CM22. Moist soils near wetlands, streams lakes or springs in the project area will be promptly revegetated if construction activities impact the vegetation in these areas. Revegetation will be designed to avoid the establishment of noxious weeds.
- CM23. Companies operating in areas identified with weed infestations or suitable Ute ladies'-tresses orchid habitat will be required to submit an integrated pest management plan prior to APD approval. The components of the integrated pest management plans are outlined in the CBM APD and POD Preparation Guide. Mitigation will be determined on a site-specific basis and may include such measures as spraying herbicides prior to entering areas and washing vehicles before leaving

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infested areas. Infestation areas of noxious weeds have been identified through the County Weed and Pest Districts and are available at the Bureau's Buffalo Field Office.

- CM24. Additional mitigation measures may be necessary if the site-specific project is determined by a Bureau biologist to have an adverse affect to Ute ladies'-tresses orchids or their habitat.

Mountain Plover

- CM25. In the event that a mountain plover (dead or injured) is located during construction or operation, the Service's Wyoming Field Office (307- 772-2374) and the Service's Law Enforcement Office (307-261-6365) will be notified within 24 hours.
- CM26. Site-specific project areas will be evaluated for suitable mountain plover nesting habitat prior to permit approval. Flat areas of short-grass prairie or low shrubs with a prevalence of bare ground characterize suitable mountain plover nesting habitat. Typically the vegetation height is less than 4 inches, and bare ground is greater than 30 percent.
- CM27. The Bureau shall monitor all take of mountain plover habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of the Bureau but can be delegated to the Bureau's agent (consultant, contractor, etc). A written summary will be provided to the Service's Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the FEIS for the Powder River Basin Oil and Gas Project and the ROD. The semi-annual reports will include all actions completed 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and on the anniversary dates of the signing of the ROD. Reporting will continue for the life of the project.
- CM28. No ground-disturbing activities shall occur in suitable nesting habitat prior to surveys for nesting mountain plovers conducted in compliance with the Service's Mountain Plover Survey Guidelines (USFWS 2002). A Bureau-approved biologist will conduct the surveys. Once occupied mountain plover nesting habitat is located, the Bureau shall initiate section 7 consultation with the Service on any project-related activities proposed for such habitat. The amount and nature of ground-disturbing activity shall be limited within identified nesting areas in a manner to avoid the abandonment of these areas.
- CM29. Operators and the Bureau shall be provided by the Service with educational material illustrating and describing the mountain plover, its habitat needs, life history, threats,

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- and gas development activities that may lead to incidental take of eggs, chicks, or adults with requirements that these materials be posted in common areas and circulated in a memorandum among all employees and service providers.
- CM30. A disturbance-free buffer zone of 0.25 mile would be established around all mountain plover nesting locations between March 15 and July 31.
- CM31. Project-related features that encourage or enhance the hunting efficiency of predators of mountain plovers would not be constructed within 0.25 mile of known mountain plover nest sites.
- CM32. Construction of ancillary facilities (e.g., compressor stations, processing plants) shall not be located within 0.5 mile of known nesting areas. The threats of vehicle collision to adult mountain plovers shall be minimized, especially within breeding aggregation areas.
- CM33. Where possible, roads will be located outside of mountain plover nesting areas. Maximum allowed travel speed on roads within 0.5 mile of identified mountain plover nesting areas shall not exceed 25 miles per hour from March 15 to July 31.
- CM34. Maximum design speed on all operator constructed and maintained roads shall not exceed 25 miles per hour.
- CM35. Work schedules and shift changes should be set to avoid the periods from 30 minutes before to 30 minutes after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.
- CM36. The Bureau shall monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads. The presence of carrion could attract mountain plover predators.
- CM37. Creation of hunting perches or nest sites for avian predators within 0.5 mile of identified nesting areas shall be avoided by burying power lines, using the lowest possible structures for fences and other structures, and by incorporating perch-inhibiting devices into their design.
- CM38. Capped and abandoned wells shall be identified with markers no taller than 4 feet with perch inhibiting devices on top to avoid creation of raptor hunting perches within 0.5 mile of nesting areas.
- CM39. Reclamation of areas of previously suitable mountain plover habitat would include the seeding of vegetation to produce suitable habitat for mountain plovers.

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- CM40. To minimize destruction of nests and disturbance to breeding mountain plovers from reclamation activities, no grading, seeding, or other ground-disturbing activities shall occur from April 10 to July 10 unless surveys consistent with the Service's Mountain Plover Survey Guidelines (USFWS 2002) find that no mountain plovers are nesting in the area.
- CM41. Additional mitigation measures may be necessary if the site-specific project is determined by a Bureau biologist to have an adverse affect to mountain plovers or their habitat.

## STATUS OF SPECIES

### Bald eagle

On February 14, 1978, the bald eagle was listed as endangered in all of the conterminous United States except Minnesota, Wisconsin, Michigan, Oregon, and Washington, where it was classified as threatened (43 F.R. 6233). The Service reclassified the bald eagle from endangered to threatened throughout its range in the lower 48 states on July, 12, 1995 (60 F.R. 36000). The bald eagle was proposed for delisting on July 6, 1999 (64 F.R. 36454). Currently, the proposal has not been finalized or withdrawn.

### Description

The bald eagle is a large, long-lived bird of prey. Adults have dark-brown bodies, white heads and white tails. This adult plumage is not usually acquired until age four. Juveniles go through a series of plumages prior to achieving the adult coloration and in some plumages the young bear a superficial resemblance to golden eagles (*Aquila chrysaetos*).

### Life History/Habitat Use

The eagle may live up to 45 years, achieve sexual maturity at 4 to 5 years, and produce one to three young per year. Publications by the U.S. Army Corps of Engineers (1979), Lincer et al. (1979), U.S. Bureau of Land Management (1973) and Brown and Amadon (1968), provide references on the biology of the species.

Bald eagles usually nest in trees near water, but are known to nest on cliffs and the ground. Nest sites are usually in large trees along shorelines in relatively remote areas that are free of disturbance (USFWS 1999a). The bald eagle typically lays a clutch ranging from one to three eggs which are incubated by both the male and female birds for approximately 35 days resulting in usually one or two eaglets produced by the pair (Stalmaster 1987). The recommended spatial buffer around nests for threatened and endangered raptors, including the bald eagle, is 1-mile (Romin and Muck 1999). The *Greater Yellowstone Bald Eagle Management Plan 1995 update* (Greater Yellowstone Bald Eagle Working Group (GYBEWG) 1996) and the *Montana Bald Eagle Management Plan* (Montana Bald Eagle Working Group (MBEWG) 1994), identify three

concentric nest management zones, that surround most recently active and alternate nest sites, and vary by degree of allowable disturbance. Zone I includes the primary nest site area in which human activity or development may stimulate abandonment of the breeding area, affect successful completion of the nesting cycle or reduce productivity (GYBEWG 1996, MBEWG 1994). It includes the area within a 0.25-mile radius of all nest sites in the breeding area that have been active within 5 years or are presently active. Zone II is the Primary Use Area that includes the area 0.25-mile to 0.5-mile from all nest sites that have been active within 5 years. Zone III represents most of the home range used by eagles during the nesting season and usually includes all suitable foraging habitat within 2.5 miles of all nest sites in the breeding area that have been active within five years (GYBEWG 1996, MBEWG 1994).

For the purposes of this biological opinion, bald eagle habitat is defined as all suitable foraging habitat within 2.5 miles of all recently active and currently active bald eagle nests. Furthermore, the Service defines a recently active bald eagle nest as a nest which has been active within the past 5 years. Bald eagle nesting habitat is defined as any mature stand of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes or any significant body of water. Bald eagle roosting habitat is defined as any mature stands of conifer and cottonwood trees.

Research shows that bald eagles are sensitive to a variety of human activities. Responses to human disturbance vary and may include short term, temporal, or spatial avoidance of the disturbance, to total reproductive failure and abandonment of breeding areas (GYBEWG 1996, MBEWG 1994, Anthony et al. 1995, Stalmaster and Newman 1978). Responses of bald eagles to human disturbance vary depending on the eagle individual/pair, and the type, intensity, duration, time of year, predictability, and location of human activity (Knight and Cole 1995). Survival of individual eagles, particularly those in their first year of life, probably depends heavily on conditions they encounter during the wintering period. The physiological condition of adults at the beginning of each breeding season, an important factor influencing reproductive success, also is affected by how well their energy demands are met in wintering areas. Thus, the survival and recovery of nesting populations depends on the eagles having suitable locations to use throughout the wintering period each year (USFWS 1983). Bald eagles are extremely sensitive to disturbance during nest building, egg laying, and incubation periods (February 1 through May 30). Bald eagles are most likely to desert nest sites during this period if disturbed (GYBEWG 1996, MBEWG 1994), especially if the activity occurs within Nest Management Zones I and II.

During migration and at wintering sites, eagles that concentrate on locally abundant food tend to roost communally. Communal roosts usually are located in stands of mature old growth conifers or cottonwoods, and roosts may be several miles from feeding sites. Wintering bald eagles occur throughout the Nation but are most numerous in the West and Midwest (USFWS 1983). An abundant, readily available food supply in conjunction with one or more suitable night roost sites is the primary feature of winter habitat. Also, eagles prefer to forage in areas with the least human disturbance (USFWS 1978, McGarigal et al. 1991).

The majority of wintering eagles are found near open water where they feed on fish and waterfowl, usually taking those which are dead, crippled, or otherwise vulnerable (USFWS 1983, Lingle and Krapu 1986, Stalmaster and Associates 1990). In addition, eagles are known to feed on carrion, small mammals, and game birds (Lish 1975, U.S. Bureau of Reclamation 1981, Lingle and Krapu 1986). Lingle and Krapu (1986) found eagles consumed at least 50 species of fish, birds, and mammals along the North Platte and Platte Rivers during the winters of 1978-1979 and 1979-1980.

Large, live trees in sheltered areas provide a more favorable thermal environment and help minimize the energy stress encountered by wintering eagles. Communal roosting also may facilitate food-finding (Steenhof 1976) and pair bonding. The proximity of adequate night roosts to the other habitats required by wintering eagles, such as hunting perches and feeding sites, is important (Steenhof et al. 1980). In some locations, the absence of a suitable night roost may limit the use of otherwise suitable habitat. Freedom from human disturbance also is important in communal roost site selection (Steenhof et al. 1980, U.S. Bureau of Reclamation 1981, USFWS 1986, Buehler et al. 1991). Continued human disturbance of a night roost may cause eagles to abandon an area (Hansen et al. 1981, Keister 1981). Typically, buffers around roost sites are one-half the size of buffers around nest sites, so a seasonal buffer zone for wintering bald eagles would be 0.5-mile (Romin and Muck 1999). However, personnel observations suggests that for winter roosts sites in eastern Wyoming, bald eagles appear to be less tolerant of disturbance and a 0.5-mile buffer for winter roost sites may be inadequate (Fitzgerald 2002). For the purposes of this biological opinion an occupied roost site or roost is defined as a stand of mature or old growth conifer or cottonwood trees that harbors at least six bald eagles on any given night.

Although eagle population studies have revealed that both reproduction and survival are important, changes in survival rates seem to have more effect on the population than similar changes in reproductive rates (Grier 1980). Hypothetical population modeling indicates it is possible for eagle populations with lower reproduction but adequate survival to do better than other populations with higher reproduction but poor survival. Adult eagles must prepare themselves for the next breeding season, and subadults and immature eagles must survive stressful environmental conditions. Therefore, maintaining and/or improving winter survival is crucial to eagle recovery (USFWS 1978 and 1983).

## Distribution

Historically, the bald eagle nested in at least 45 of the contiguous 48 states, with an estimated 250,000 - 500,000 bald eagles living on the North American continent before the first Europeans arrived. The breeding range of the bald eagle was greatly diminished during the nineteenth and twentieth centuries. Present-day breeding occurs primarily in northern California, Alaska, Oregon, Washington, Minnesota, Wisconsin, Michigan, Maine, the Chesapeake Bay area, Florida, the tri-state corner of Idaho, Montana, and Wyoming, and in parts of Canada. The

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Service estimated the breeding population exceeded 5,748 occupied breeding areas in 1998 (USFWS 1999a). Bald eagles winter throughout the country, but are most abundant in the West and Midwest.

Bald eagles occur year-round in Wyoming. Wintering bald eagles generally occur in areas with open water on large water bodies and near concentrations of winter ungulates, waterfowl and/or fish (U.S. Department of Interior 1986, GYBEWG 1983, MBEWG 1994). Freedom from human disturbance is an important component of wintering habitat (Detrich 1978, Fitzner and Hanson 1979). Statewide surveys for nesting bald eagles were initiated in Wyoming in 1978 (Wyoming Game and Fish Department 1996). The Wyoming population has been increasing, and in 1994, 70 pairs attempted nesting, with a resultant 67 fledglings (Wyoming Game and Fish Department 1996). The greatest nesting concentration occurs in the Greater Yellowstone area. However, several breeding pairs also occur along major drainages throughout the State (Wyoming Game and Fish Department 1996).

### Status and Threats

Wyoming falls within the area of the Pacific Bald Eagle Recovery Plan (USFWS 1986). The primary objective for this area is to provide secure habitat for bald eagles within the 7-state Pacific recovery area and to increase population levels in specific geographic areas to the extent that the species can be delisted. One recovery criterion is to have stable or increasing wintering populations.

The decline in nesting populations during the twentieth century has been attributed to habitat loss (identified as the most significant long-term threat to all bald eagle populations in the recovery area), environmental contamination, electrocution, shooting, poisoning, and trapping (USFWS 1986). These problems still exist today and are a growing concern (Hartman 2002). Numerous cases of bald eagle and golden eagle poisoning have been caused by landowners unlawfully misusing pesticides and other chemicals for predator control.

By the late 1960's, the pesticide dichloro-diphenyl-trichlorethane (DDT) and its metabolites had caused widespread reproductive failures and resulted in drastic decreases in eagle numbers continent-wide (Sprunt et al. 1973, Wieneuyer et al. 1972). Other contaminants such as polychlorinated biphenyls and heavy metals such as mercury and lead may contribute to increased eagle mortality in some areas. The exact impact of DDT and other contaminants on bald eagles in Wyoming is not known.

Secondary poisoning in eagles from eating lead-poisoned prey, particularly ducks and geese, was a concern identified in the early 1980's by Pattee and Hennes (1983). They reported that of 650 dead eagles, 7.2 percent probably died from lead poisoning. Their field evaluations in Missouri and Minnesota found 9-11 percent of digested eagle pellets contained lead shot. However, Lingle and Krapu (1988) found in a wintering eagle study (1978-1980) that cast pellets contained

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a small percentage (0.3 percent) of lead shot. Due to the use of nontoxic shot being phased in during the 1980's and now required in many areas across the nation, the potential for eagles to suffer ill-effects or death from lead shot ingestion has likely decreased.

Loss of eagle habitat continues to be the most significant long-term threat to bald eagle populations within the 7-state Pacific recovery area. Development, both urban and recreational, logging, mineral exploration and extraction, as well as others forms of human activity are adversely affecting suitable breeding, foraging and wintering habitats (USFWS 1986). The Pacific Bald Eagle Recovery Plan (USFWS 1986) identifies that the cumulative long-term effects of small scale actions and individual projects, while not jeopardizing the continued existence of

the species, are the single most important threat to bald eagle recovery. Increased human activity and various land developments can adversely affect the suitability of breeding and wintering habitats (Juenemann and Frenzel 1972, Lish 1975, Grubb and King 1991).

As early as 1922 researchers noted the electrocution of raptors. However, not until the 1970's did researchers become aware of the magnitude of the problem. Franson et al. (as cited in Avian Power Line Interaction Committee (APLIC) 1996) summarized that 12 percent of the known bald eagle mortalities were the result of electrocution. Electrocution deaths of bald eagles have been documented across the country, including Wyoming (APLIC 1996). Between 1986 and 1996 electric utility company records from across the western United States and Canada showed that 118 bald eagles and an additional 358 unidentified eagles were electrocuted (Harness 2002). Bald eagles frequently congregate in large numbers during the winter (Stalmaster 1987). In predominately treeless areas, such as the Powder River Basin, power poles may be the only perches available to bald eagles.

Approximately 77 eagles have been electrocuted on power lines, including 1 bald eagle, in a 1 year period in the Powder River Basin (Domenici 2001). An unknown number of additional bald eagle kills have resulted from collisions with power lines (Domenici 2001). In Montana, within the Powder River and Billings Resource Management Plan (RMP) project area, bald eagle mortality from electrocution by small distribution power poles and collision with small distribution power lines common to oil and gas development was documented in 2000 and 2001 (Schomburg 2001). Data were collected from 303 carcasses from 1996-2001, with data from 273 carcasses collected in 2000 and 2001. Cause of death of 23 raptors were attributed to mid-span collisions, with 21 identified as golden eagle and 1 as bald eagle (Schomburg 2001). Causes of death of 280 raptors were attributed to electrocution, with 219 identified as golden eagle, 4 as bald eagle and 11 as either golden or bald eagles (Schomburg 2002).

### **Ute ladies'-tresses orchid**

Ute ladies'-tresses orchid was listed as a threatened species on January 17, 1992 (57 F.R. 2048). Populations of the Ute ladies'-tresses occur in relatively low-elevation riparian meadows with concentrations in three general areas of the interior western United States: the Wasatch Front



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and west desert of Utah, the Uinta Basin in Utah, and the Front Range of Colorado and Wyoming (USFWS 1992). Ute ladies'-tresses was described by Sheviak (1984) based on material collected in Colorado and Utah. Previously, populations had been confused with other species of *Spiranthes* (USFWS 1992).

### Description

Ute ladies'-tresses is a perennial, terrestrial orchid with stems 20 to 50 cm tall arising from tuberously thickened roots. Its narrow leaves are about 28 cm long at the base of the stem and become smaller in size going up the stem. Flowers consist of few to many small white or ivory flowers clustered into a spike arrangement at the top of the stem (USFWS 1992).

### Life History/Habitat Use

Ute ladies'-tresses blooms from late July through August. However, depending on location and climatic conditions, orchids may bloom in early July or still be in flower as late as early October. The Ute ladies'-tresses is endemic to moist soils near wetland meadows, springs, lakes, and perennial streams. It occurs generally in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows at elevations from 4,200 to 7,000 feet. The orchid colonizes early successional riparian habitats such as point bars, sand bars, and low-lying gravelly, sandy, or cobbly edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing season. The species occurs primarily in areas where the vegetation is relatively open and not overly dense, overgrown, or overgrazed (Coyner 1989 and 1990; Jennings 1989 and 1990). Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system.

Ute ladies'-tresses begins flowering at the end of July, although the inflorescence begins to emerge as early as June. Flowering duration depends upon moisture and light conditions, but may continue until early September. Reproduction appears to be strictly sexual with bumble bees as the primary pollinators (USFWS 1995). Fruit set occurs in late August through September. At the end of the growing season, small rosettes often emerge at the base of the plants and persist through the winter months. Two or more plants may occur in clumps, but it is not known whether these clumps are single or multiple individuals.

Arditti (as cited in USFWS 1995) indicated that orchids often have very small seeds requiring specific symbiotic associations with mycorrhizal fungi for germination. Many species of *Spiranthes* are initially saprophytic, underground plants that persist for many years before leaves emerge above ground (*S. spiralis* takes 11 years from germination to green leaf production, with 8 years spent in the mycorrhizal stage) (USFWS 1995). Ute ladies'-tresses may be similar to other species of *Spiranthes* which bloom less often than annually (*S. spiralis* plants rarely flower in consecutive years and *S. magnicamporum* may bloom as rarely as once in 20 years) (USFWS 1995).

## Distribution

Ute ladies'-tresses is currently known from western Nebraska, southeastern Wyoming, north-central Colorado, northeastern and southern Utah, east-central Idaho, southwestern Montana, and north-central Washington (Moseley 1998). In Wyoming, Ute ladies'-tresses is known to occur at four locations in Converse, Goshen, Laramie, and Niobrara counties. Range-wide the plant is now known from over 60 locations representing at least 30 populations (Fertig 2000).

Because of the plant's irregular flowering pattern, sites that have been surveyed with negative results in the past could still support populations (Mosely 1998). Fertig (2000) recommends high-quality sites be resurveyed periodically on the chance the species was not flowering or emergent during earlier visits.

## Status/Threats

Due to the small size of most populations and the erratic population fluctuations noted within monitored populations, it is not known whether existing populations are demographically stable over the long term. The highly variable demographic structure from year to year of the species' largest known population may make it more vulnerable to extinction in years of low population numbers (USFWS 1992). The species' low population numbers and restricted habitat make it vulnerable to natural or human-caused disturbances. Extant populations in eastern Wyoming and

Colorado are typically very small and potentially vulnerable to habitat changes that could eliminate entire populations. Projects that affect the hydrology and vegetation of the species' riparian ecosystem may have a negative impact on the species (USFWS 1992).

The Ute ladies'-tresses is believed to be extirpated from most of its historical range due to alterations of stream morphology and hydrology. Hydrology of a stream is integral to the structure and function of the ecosystem (Busch and Scott 1995). Flow timing, flow quantity, and water table characteristics influence riparian vegetation (Pague and Grunau 2000). Specific levels of change in hydrology and how they affect Ute ladies'-tresses are not well understood, but Auble et al. (1994) did show significant vegetation changes after losses greater than 0.5 meters in ground water levels. Channelized and depleted streams are no longer capable of creating the semi-open habitats or maintaining the hydrologic conditions that sustain damp rooting zones throughout the growing season. The Service believes recovery of the species will involve management of stream habitats to retain, recreate, or mimic natural stream morphology and

hydrology and related vegetation dynamics. Projects that alter natural stream morphology and hydrology, change the vegetation of the species' riparian ecosystem, or cause direct ground disturbance may negatively affect the Ute ladies'-tresses where it exists.

Crain (as cited in USFWS 1992) reports that the Ute ladies'-tresses orchid is highly palatable and is preferentially grazed by small herbivores. While excessive grazing is thought to be

detrimental to the Ute ladies'-tresses, mild to moderate livestock grazing may be beneficial by reducing competing vegetation. Based on research involving habitat/population modeling by Arft (1995), the South Boulder Creek (Colorado) hay meadow colonies do not appear viable without human intervention. According to Arft's model, traditional winter grazing is necessary to maintain stable population growth. Mowing, if timed according to orchid phenology (modified to occur earlier so not to damage growing orchids), may achieve the same results. At this population, grazing and irrigation serve to maintain the ordinarily "natural" suitable conditions of reduced vegetative competition. However, depressed inflorescence and fruit production have been observed at sites that are grazed in late summer (Arft 1995 in Fertig 2000).

Other examples of adverse effects associated with grazing have been noted, but the overall effect of grazing on Ute ladies'-tresses appears to be low (Fertig 2000). The relationship between grazing and the establishment of redbud (*Agrostis stolonifera*) and certain noxious weeds is poorly understood, as are the impacts of grazing and trampling on insect pollinators (Fertig 2000). Many of the known remaining populations are relict in nature, remaining in small areas where livestock grazing was less intense than in other riparian communities within the species' range (USFWS 1992). Mowing can also be either beneficial by reducing competing vegetation or detrimental if done before fruit have ripened, or if the height of the cutting is too low, reduced fruit production may occur (Fertig 2000).

### **Mountain Plover<sup>1</sup>**

The mountain plover was proposed for listing as a threatened species on February 16, 1999 (64 F.R. 7587). The mountain plover is a small bird, about the size of a killdeer (*Charadrius vociferus*), in the plover family (Family *Charadriidae*). The type specimen was collected in 1837 by J. K. Townsend on the Sweetwater River of Wyoming. There are no recognized subspecies.

#### **Description**

The mountain plover is a compact bird (about 7-9 inches long) with light brown above and paler underparts, lacking the contrasting dark breast bands typical of many other plover species. In flight, its underwings are white. Breeding plumage differs only by the addition of a dark line between the bill and eyes contrasting with a pale forehead. The bill is black, the legs are gray to light brown-yellow, feet are dark brown, and claws are black. The sexes are alike.

#### **Life History/Habitat Use**

The mountain plover is a migratory species of the shortgrass prairie and shrub-steppe eco-

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<sup>1</sup> Unless otherwise noted, the information provided in this section was taken from the proposed rule to list the mountain plover as threatened under the Act (64 F.R. 7587).

regions of the arid West. The universal characteristics of mountain plover habitat on both the breeding and wintering grounds are short vegetation, bare ground, and flat topography. They are found

associated with plains, alkali flats, agricultural lands, cultivated lands, sod farms, prairie dog towns, and low shrubs at both breeding and wintering locales. Unlike other plovers, they are rarely associated with water.

In Montana, there is compelling evidence that mountain plovers are dependent on active prairie dog colonies for nesting (Dinsmore 2000). Mountain plover selectively use black-tailed prairie dog towns (*Cynomys ludovicianus*) for breeding, nesting, and feeding (Knowles and Knowles 2001, Dinsmore 2001, Dinsmore 2000, Olson-Edge and Edge 1987, Olson and Edge 1985, Olson 1985, Knowles and Knowles 1984, Knowles et al. 1982). However, not all prairie dog towns offer suitable habitat for mountain plovers, mostly due to topographic incompatibility. In addition, there are habitats other than prairie dog towns that provide nesting, feeding and breeding habitat for mountain plover in Montana. Knowles and Knowles (1998) demonstrated that barren areas with glacial till, stockwater sites grazed by cattle, sheep, and ground squirrels, dwarf shrub communities associated with silty overflow sites and bentonitic soils, all have some levels of documented mountain plover use. Livestock and/or bison (*Bison bison*) grazing on prairie dog towns will increase mountain plover use substantially (Knowles and Knowles 2001).

Knowles and Knowles (2001) still conclude that “based on historical notes and contemporary observations, viable populations of mountain plovers are probably dependent upon extensive areas of black-tailed prairie dog colonies.”

The dependency of mountain plovers on prairie dogs in Montana is probably tied to two factors: habitat and food (Dinsmore 2001). Mountain plovers prefer to nest on flat, arid landscapes, especially in areas that are intensively grazed (Knopf 1996). In Montana, the only open, grazed habitat is found on active prairie dog colonies (Dinsmore 2001). Prairie dog colonies also harbor more food items than the surroundings habitats (Dinsmore 2001, Knopf 1996). Mountain plovers are insectivorous with beetles, grasshoppers, crickets, and ants as their principal food items (Rosenberg et al. 1991).

The nest of the mountain plover is a simple scrape on the ground, which may be lined with debris. Nests are usually placed in areas where vegetation is less than 4 inches in height, the amount of bare ground in the area exceeds 30 percent, and near a conspicuous object such as a manure pile or rocky area. In shortgrass prairie habitat, vegetation associated with nest sites includes *Bouteloua gracilis* (blue grama), *Buchloe dactyloides* (buffalo grass) and *Opuntia* spp. (prickly pear cactus). In shrub-steppe grasslands, vegetation around nests includes low-growing shrubs such as *Artemisia nova* (black sage) and *Atriplex gardneri* (Gardner saltbush) (Day 1994, Knopf 1996). Topography is typically flat or gently rolling. Nesting areas consistently have slopes less than 12 percent with the majority of plover sightings on slopes of less than 8 percent (Knowles et al. 1982, Parrish 1988, Beauvais and Smith 1999). Generally, “suitable mountain

plover habitat” refers to areas containing these characteristics: low relief, vegetation generally less than 4 inches in height, and bare ground present and at least locally exceeding 30 percent of the area.

The breeding season begins soon after birds arrive in late March or early April. Breeding season displays involve different calls and flight displays, including “falling leaf” and pursuit flights to advertise territory occupancy and define boundaries between territories. Territories in Colorado are about 40 acres and adjacent territories may overlap significantly along boundaries. Breeding plovers show close site fidelity, often returning to the same territory in subsequent years. Territories tend to be aggregated with several breeding pairs occurring within a few square miles surrounded by empty but apparently suitable habitat (Knopf 1996).

Nests may be initiated 1-2 weeks after arrival on the breeding grounds and the clutch of 3 eggs may take 3-12 days to complete. Incubation lasts approximately 28-31 days (Ehrlich et al 1988). In Colorado, egg-laying began April 15, continuing through mid-June, with one late nest observed June 23 (Graul 1975). Adults were found to incubate or attend nests with increasing frequency and duration as the incubation period continued. Nest attendance in Wyoming increased from approximately 50 percent of daylight hours early in incubation to approximately 100 percent within days of hatching (Laun 1957). Eggs appear highly resistant to chilling but susceptible to overheating in the sun due to their dark coloration (Knopf 1996).

Chicks leave the nest soon after the last egg hatches. Chicks are usually attended by one adult, brooded about one-third of the time for the first day. Daily movements of the broods may be extensive, with broods ranging over as much as 200 acres between hatch and fledging. Chicks fledge approximately 33 days post-hatch (Knopf 1996).

Known predators of adult mountain plovers are few. Kit fox (*Vulpes macrotis*) and prairie falcon (*Falco mexicanus*) are the only documented predators of adults. However, their ground nests are vulnerable to mammalian predators including the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), swift fox (*Vulpes velox*), badger (*Taxidea taxus*), and coyote (*Canis latrans*), and possibly corvids (crows, ravens and magpies). Ground squirrels, coyotes, Swainson’s hawks (*Buteo swainsonii*), prairie falcons (*Falco mexicanus*), and loggerhead shrikes (*Lanius ludovicianus*) have been observed taking flightless young (Knopf 1996).

Species in the shorebird family are generally long-lived, with low annual reproductive rates and small clutch sizes. Available information on the mountain plover conforms to this pattern. Annual survival estimates for this species are unavailable, though over-winter survival is high, estimated at 0.9474 from a sample of 44 birds (Knopf 1996). Few data exist on the life span of the mountain plover, though one banded bird was recovered after 6 years.

Mountain plovers probably start breeding in their second year of life. Normal clutch size is three, very rarely four. Two-egg clutches probably result from predation of individual eggs.

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Birds are largely monogamous, though the pair bond is only maintained for a short period during breeding.

There is some evidence that at least some females lay two clutches, one brooded by the male and the other by the female, with this strategy common in some years (Knopf 1996).

Nest success has been estimated to vary from 26-65 percent between years and may be influenced by rainfall. Mountain plovers in Weld County, Colorado, fledged an estimated 0.26 and 1.4 young per nest in different studies between 1969 and 1974, though the higher estimate is believed to be biased by the exclusion of nests which totally failed (Knopf 1996). In Phillips County, Montana, annual nest success was between 45 percent in 1999 and 72 percent in 2000 with a average annual nest success of 58 percent for 600 nests pooled across years (Dinsmore 2001).

### Distribution

Mountain plovers occupy suitable breeding habitat in many of the Great Plains states from Canada south to Texas from late March through July. Flocks may form as early as mid-June prior to migration to wintering habitats in August through October. Wintering areas are concentrated in the Central Valley of California, Texas and Mexico. There are no wintering areas in Wyoming. Historically, the mountain plover was considered numerous on breeding grounds in western and central Kansas and Oklahoma, western Nebraska and South Dakota, and eastern Colorado, Montana, and Wyoming.

Montana, Colorado and Wyoming have the majority of breeding mountain plovers, although some breed in Kansas, Nebraska, New Mexico, and Oklahoma (USFWS 1999b). Approximately 1,500 birds are estimated to occur in Wyoming. Birds have been observed during the breeding season over much of the shortgrass prairie of the eastern parts of the State, with high densities reported in the Laramie Plains of northern Albany County and eastern Carbon County (Laun 1957, Johnson et al. 2000), Converse County (Parrish 1988), Laramie County (Graul 1975), Park County (U.S. Bureau of Land Management 1988), and Sweetwater County (Beauvais and Smith 1999).

### Status and Threats

The mountain plover was designated a category 2 candidate species on December 30, 1982 (47 F.R. 58458), meaning that the species may be declining but more information was needed. The Service elevated its status to category 1 candidate in the 1994 Annual Candidate Notice of Review (59 F.R. 58982), meaning that listing was warranted, but precluded by higher priority species. In 1996, the Service did away with candidate categories 2 and 3, re-defining candidate species to include only former category 1 candidate species (61 F.R. 64481). The mountain plover was retained as a candidate species in the 1997 status review (62 F.R. 49298). The species was petitioned for listing as threatened on July 7, 1997. Due to its candidate status, no

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90-day finding was required in response to this petition. On February 16, 1999, the Service gave notice of a proposal to list the mountain plover as a threatened species pursuant to the Act (64 F.R. 7587). A final listing decision on this species is pending.

Endemic grassland birds have declined more rapidly than other bird species, and the mountain plover's decline is greater than the other grassland endemics (Knopf 1994, Sauer et al. 1997). Available data indicate that population numbers of mountain plovers have declined range-wide by more than 50 percent since 1966 to fewer than 10,000 birds. The eastern extent of the range has been greatly reduced, possibly due to conversion of native prairie to cultivated agriculture as well as control of burrowing rodents. Mountain plovers are no longer known to breed in Canada or South Dakota.

Identified or suspected reasons for the decline include conversion of shortgrass and shrub steppe habitats, changes in range management to emphasize uniform grass cover, declines in native ungulates and burrowing animals, oil and gas development and associated road construction, and possibly population sinks created by certain agricultural practices. A population 'sink' (Pulliam 1988) is an area within the breeding range of a species or population where reproduction is not adequate to balance mortality, but population levels are maintained by immigration of breeders produced in a nearby 'source' area.

Strategies adopted by the Forest Service and the Bureau, should be effective in minimizing impacts on Federal lands, but the likelihood of these measures being implemented on split-estate lands or private property is less than for the activities on Federal lands (USFWS 1999b). The time-of-year and spatial buffers adopted by the Forest Service and the Bureau to protect nesting mountain plovers would only have value when the essential nesting characteristics are not permanently altered. In the absence of such provisions, however, and given the current rate of oil and gas development, the Service believes that oil and gas development could be a threat to mountain plovers and their habitat (Brockway 1992).

### **Black-footed ferret**

We concur with your determination that the action is not likely to adversely affect the black-footed ferret (*Mustela nigripes*). This concurrence is based upon the Bureau's commitments to (1) locate project activities to avoid impacts to prairie dog colonies that meet Service criteria as suitable black-footed ferret habitat (1989) wherever possible; (2) conduct ferret surveys in suitable habitat, regardless of burrow density, and (3) allow no disturbance within prairie dog colonies that are found to be inhabited by black-footed ferrets.

## **ENVIRONMENTAL BASELINE**

### **Bald Eagle**

There are 10 historically active bald eagle nests within the Powder River Basin Oil and Gas

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Project area. Forty-two bald eagle winter roosts have been documented within the project area. However, our records do not identify how many bald eagles have been observed at each roost site. The eastern front of the Big Horn Mountains and the Powder River Basin is a known wintering area for bald eagles. Sightings of bald eagles are common during the winter months in the project area. Due to the large proportion of private land within the project area which have not been surveyed, additional winter roost sites likely exist.

Historically, these bald eagle nests and winter roosts have been affected by relatively few activities. Grazing has been the predominant land use in the area and has likely had only minimal effects on the eagles and their habitat, although some impacts to riparian areas may have occurred. Conventional oil and gas development continues to occur in the Powder River Basin with 4,351 conventional oil and gas wells completed as of December 31, 2001 (Likwartz 2002). Drilling for CBM in the Powder River Basin began in 1985. As of May 29, 2002, 13,306 CBM wells have been drilled with roughly 9,000 wells in production (Likwartz 2002). Additionally, the project area is heavily impacted by coal mining operations. Currently surface lands are being disturbed by coal mining activities at a rate of approximately 2,000 acres per year. Coal mining has disturbed 54,000 acres within the project area. At least 26,610 additional acres of land proposed for coal mine expansion is presently included in the Bureau's pending Lease by Application process. Other mining activities within the Powder River Basin include uranium mining (approximately 4,400 acres disturbed), sand, gravel and scoria mining (combined disturbance 1,200 acres). Agricultural development has resulted in the conversion of approximately 113, 643 acres of native short-grass prairie (FBA 2002).

### **Ute Ladies'-tresses**

Ute ladies'-tresses is currently known from four sites in eastern Wyoming, including: a small population along a tributary to Antelope Creek (a tributary to the Cheyenne River) in northwest Converse County; a population along Bear Creek in southwestern Goshen County; a population along the Niobrara River near McMaster's Reservoir in southeastern Niobrara County; and, a population along Sprager Creek in Laramie County. These populations are monitored on a limited basis and appear to be stable. Mowing and grazing occur at two of the sites and appear to have only minor impacts on the populations.

Few surveys for Ute ladies'-tresses have been conducted in the project area. However, the population along a tributary to Antelope Creek in Converse County occurs on Bureau land just upstream of the project area. This population was originally discovered in 1994 and has been censused several times since then. The population remains small (11-35 plants seen during various years). The habitat is considered marginal and the population is the least viable of the populations within Wyoming (Fertig 2000).

If large areas of suitable habitat occur in the project area, it is likely they would have been surveyed for Ute ladies'-tresses already. Likewise, if large, stable populations of the plant occur in the project area, it is likely they would have been discovered by now. However, that does not



preclude the possibility of smaller patches of suitable habitat or smaller populations having gone undetected to date.

Human activities that have detrimentally affected Ute ladies'-tresses and continue to pose a threat include stream alterations such as channeling, diversions, culverts, and levees; wetland filling; gravel mining; and introduction of exotic or aggressive plant species. All of these activities have

occurred historically and continue, although less frequently. These activities have been documented to directly affect orchid colonies when they occur on site or may indirectly affect the orchids and their habitat when taking place upstream or adjacent to existing orchid colonies.

Direct herbivory of Ute ladies'-tresses by livestock and deer has been observed on occasion and may be considered to be detrimental. Some grazing outside of the Ute ladies'-tresses growing season has been shown to be beneficial by reducing competition. However, the small size of the population of Ute ladies'-tresses located near the project area may be due to poor seed production resulting from grazing of fruiting stalks (Fertig 2000).

Coal mining has been a major influence in the southern part of the project area and has adversely affected Ute ladies'-tresses habitat in some areas. Coal bed methane development may also be having an adverse effect on Ute ladies'-tresses. The water produced by more than 9,000 wells in production (in 2001 approximately 6,400 wells produced 182 acre-feet per day, (Likwartz 2002)) may have altered hydrology significantly enough to affect Ute ladies'-tresses in some areas. However, few surveys have been completed and no data have been collected to assess possible effects of CBM development and associated discharges of produced water.

### **Mountain Plover**

As indicated in the FBA, mountain plovers are likely to be found on suitable habitat throughout the entire project area. Mountain plovers are most often associated with relatively flat (less than 12 percent slope), open shortgrass prairie rangelands, often on or near prairie dog towns and other grazed areas. Plovers are also known to occur in sagebrush grasslands with sparse vegetation. Much of the Powder River Basin is characterized by level to gently rolling uplands dominated by sagebrush, with true shortgrass prairie occurring in the southern portion of Campbell County (Postovit 2000). However, much of the project area is not flat enough to be considered suitable habitat. Prairie dog towns are scattered throughout the project area, particularly in the southeastern and northwestern portions. Based on modeling which defines suitable habitat as an area of land on which the predicted probability of mountain plover being found during the breeding season is equal to or greater than 50 percent, there may be approximately 624,000 acres of suitable habitat for the mountain plover in the analysis area (Beauvais and Smith, in press). Livestock grazing is the primary land use in the project area, with some areas heavily grazed.

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The Bureau contracted with the Wyoming Natural Diversity Database and Western EcoSystems Technology Inc. to conduct presence/absence surveys for mountain plover in the Powder River Basin during the spring of 2001. A combined total of seven mountain plovers were observed within the Powder River Basin analysis area (Keinath and Ehle, 2001; Good, Young and Eddy, 2002). However, both reports qualify their results by noting that due to private landowner considerations survey routes were limited to public roads. Because much of the Powder River

Basin is privately owned, areas of suitable habitat were inaccessible and not surveyed. Therefore, the results of these surveys likely underestimate the extent of use of suitable habitat by mountain plovers within the Powder River Basin.

A number of mountain plover sightings and breeding observations have been recorded in the southeast portion of the project area. Although survey effort in the rest of the project area has been less intensive, mountain plovers have been observed. Coal mine monitoring data provide some indication of the suitability of habitat for and presence of mountain plovers on a portion of the project area. Several mines (Buckskin, Rawhide, Eagle Butte, Belle Ayr, Coal Creek, Black Thunder, and North Rochelle) have no observations of mountain plovers since monitoring of these mines began (generally in the mid-1980's). Typically, the vegetative type and lack of intensive grazing results in cover too dense and tall to be considered mountain plover habitat at these mines (Postovit 2000). The Caballo and Antelope mines have recorded mountain plover use. Although most of the permit area is not suitable habitat, plovers were documented using a saline grassy area within the Caballo mine permit area in 1992. Adult plovers were observed annually on black-tailed prairie dog towns within the North Antelope/Rochelle permit area from 1994 through 1998 (Howard Postovit, Powder River Eagle Studies, *in lit.* 1999). At the Antelope mine, breeding plovers have been documented on or near the mine in every year but one since 1982 (Postovit 2000). Additionally, Postovit (2000) indicates the vegetation in the area

has been heavily impacted by intensive livestock grazing, thus producing abundant potential habitat for the plover at Antelope mine and, generally, in that area of the Powder River Basin.

Grazing is the primary land use in the project area and appears to be compatible, and probably beneficial, to the plover. Coal mining has been a major influence in the southern part of the project area and has adversely affected plover habitat in some areas. Conventional oil and gas development continues to occur in the Powder River Basin with 4,351 conventional oil and gas wells completed as of December 31, 2001, (Likwartz 2002). Drilling for CBM in the Powder River Basin began in 1985. As of May 29, 2002, 13,306 CBM wells have been drilled with roughly 9,000 wells in production (Likwartz 2002). The presence of low density oil and gas pads may provide suitable nesting habitat for mountain plovers (Day 1994). However, no data exist for the determination of what density of oil and gas (including CBM) development may adversely affect nesting mountain plovers.

## **EFFECTS OF THE ACTION**

## **Bald Eagle**

Bald eagles may be affected by the project in several ways, including disturbance by humans and equipment noise and direct injuries and/or mortality by electrocution and collision with power lines and vehicles. Bald eagles often forage on carcasses of other animals, particularly in the winter when aquatic food resources are not as readily available. Elk (*Cervus elaphus nelsoni*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), and antelope (*Antilocapra americana*) use the project area. Several small mammals, as well as game birds and passerines, are also common in the area. An increase in available water resulting from CBM development in the project area may result in increased forage and cover for many of these species, as well as increased drinking water. This may result in increased populations of some wildlife in the project area. With the increased volume and frequency of vehicular traffic, there is a high probability of increased wildlife mortality due to vehicular collisions.

Bald eagles may be affected by disturbance near nest sites. Mineral exploration and extraction, including coal bed methane development, conventional oil and gas development, as well as others forms of human activity can adversely affect suitable breeding, nesting, and foraging habitats. Much of the project area is devoid of significant human disturbance, with grazing as the major land use. Nesting eagles may be unaccustomed to activities involving large equipment and significant human activity for even a short period of time, such as with drilling, construction of power lines and road building. However, with only ten active bald eagle nests within the project area, mostly in riparian habitat along the western edge of the project area, and the Bureau's commitment to implement the conservation measures as described in the project description section of the Bureau's FBA the Service does not anticipate the project will cause the abandonment of an active nests or nest sites.

Additionally, bald eagles may be affected by disturbance near winter roost sites and perch areas. Much of the project area is devoid of significant human disturbance, especially during the winter. Many of the eagles wintering in the area may be unaccustomed to activities involving large equipment and significant human activity for even a short period of time, such as with drilling, construction of power lines and road building. Some eagles may lose foraging opportunities and could even choose to abandon the roost sites completely, depending on the level of activity. The Bureau's commitment to maintain a year-round 0.5 mile disturbance-free buffer zone (i.e., no surface occupancy) around roost sites and an additional seasonal buffer zone of 0.5 mile (November 1 - April 1) from the outside boundary of the 0.5 mile year-round disturbance-free buffer zone and extending out an additional 0.5 mile, will lessen the likelihood of roost abandonment. However, the lack of information regarding roost site locations on private land and the lack of surveys for roost sites may leave some roost sites vulnerable to abandonment from human disturbance. For the purposes of this Biological and Conference Opinion a disturbance-free buffer zone is defined as an area where no permanent or semi-permanent physical structures (e.g. wells, roads, power lines, etc.) will be constructed nor will any human activity associated with the project be allowed without prior coordination and written concurrence of the Service's Wyoming Field Office.

**Specific phases of oil and gas development and the specific activities that may cause take are outlined below.**

Bald eagles may be affected by the project in several ways, including human disturbance, equipment noise, electrocution, collision with power lines and construction of new roads which could result in collisions with vehicles.

Development and Operation: The Service believes that as a direct result of the construction of approximately 7,136 miles of new improved roads and 5,311 miles of overhead distribution lines, there will be direct loss of bald eagles. The Bureau's FBA states that increased traffic, road kills and carrion, resulting from CBM activities, potentially increases vehicle collision hazard to bald eagles. Bald eagles often forage on carcasses of other animals, particularly in the winter when aquatic food resources are not as readily available. Foraging may also be intensified during the nesting period while adults are feeding nestlings. If there is an increase in carcass availability as a result of collisions with vehicles in the project area or increased big game hunter harvest spoils, bald eagles may increase foraging activities in the project area. Regardless of the Bureau's commitments to implement measures to lessen the likelihood of collisions, some will probably occur.

Above-ground transmission facilities even with proper design and construction requirements (APLIC 1996), can still pose an electrocution threat to bald eagles. Power lines also pose strike hazards for bald eagles, especially near perennial rivers and water bodies that support fish and waterfowl. Removal of large trees in wintering areas, particularly at established roost sites, would also displace bald eagles by removing perch and roost sites. Even though operators may adhere to all the requirements for construction of new power lines or modify existing power lines to be raptor friendly, some eagles may still be lost to line strikes or electrocution.

Reclamation and Abandonment: The Bureau has committed to seasonal and temporal buffers of bald eagle nests and winter roost sites, and surveys in suitable nesting and winter roost habitat for bald eagles where avoidance is not possible. However, reclamation of drill pads, roads, and pipelines will involve an increase in traffic, noise, and human activity from operation-level activities, possibly leading to direct take as well as disturbance and displacement of bald eagles from nests and winter roost sites in the area. Reclamation activities initiated during the breeding season, unless adequate surveys determine no nesting birds are present, may lead to nest failure by displacing attendant adults.

Interrelated and Interdependent Effects: The highly interspersed surface and mineral ownership on the analysis area creates challenges for protection of bald eagles and their habitats. There will be some actions regarding non-Federal surface and/or minerals that would not occur but for a Federal action (i.e., they are interrelated or interdependent to the Federal action). Rights-of-way for access to non-Federal in holdings is an example of a common Federal action leading to interrelated and interdependent actions on non-Federal lands. Development of non-Federal

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minerals occurring as a result of a Bureau action would have the same effects on bald eagle nests and roost sites as such development of Federal minerals, described above. To the extent that these actions are interrelated or interdependent to a Federal action, any effects to bald eagles associated with development of non-Federal minerals must be considered prior to permit issuance or other authorization by the Bureau.

### **Ute Ladies'-tresses**

Potential suitable habitat for the Ute ladies'-tresses occurs in the project area. Published documents and ongoing research on the plant, its habitat, and the hydrology of the areas occupied by and adjacent to this plant suggest possible adverse effects threatening the continued survival as a consequence of streamflow alteration. The data and information collected thus far are insufficient to ascertain exactly what effect water depletions or accretions and changes in timing of naturally occurring flows would have on the natural hydrology of the water table of habitats dependent upon project area streams. The produced water may reduce or increase Ute ladies'-tresses habitat depending on amount and timing of discharges, stream geomorphology, precipitation, and other factors.

**Specific phases of oil and gas development and the specific activities that may cause take are outlined below.**

Development: Direct impacts from construction may also occur. Due to the ability of Ute ladies'-tresses to persist below ground for years before emerging, negative findings resulting from single surveys in suitable habitat prior to disturbance do not guarantee the plant is not present. If the plant is present, loss of the entire population or some part of it may occur if there is surface disturbance in the plant's habitat or if the hydrology is significantly changed.

Operation: Discharge of water into stream systems where the plant exists may result in some adverse effect due to erosion and other changes in the stream corridor. Flows in some streams may be only slightly augmented by discharged water and may increase existing habitat or create habitat in areas where it would not have existed naturally, actually resulting in a beneficial affect to Ute ladies'-tresses. Impacts to the water table could result in significant drying and vegetative changes in some areas. Flows in some streams may be only moderately or minimally reduced due to impacts to the water table and Ute ladies'-tresses may be unaffected in these cases.

Produced water often contains high concentrations of dissolved salts, making it unsuitable for irrigation and toxic to native plants. Soil irrigated with this water will accumulate salts which destroys soil structure and inhibits water uptake by plants. The sodium absorption ratio (SAR) of produced water typically is 10-12 times the level beyond which soil will maintain structure to support plant productivity (Bauder, 2002b). While there is debate over absolute values for acceptable limits for SAR, there is consistent agreement that high SAR water is a source of

significant impairment of many soils, particularly irrigated soils and soils of arid or semi-arid regions (Bauder 2002a). Consequently, populations of Ute ladies'-tresses could be adversely affected by or eliminated by upstream surface discharges of produced water.

Abandonment and Reclamation: Although the Bureau has committed to avoidance of Ute ladies'-tresses orchid habitat where possible, and surveys in suitable habitat for Ute ladies'-tresses where avoidance is not possible. However, reclamation of drill pads, roads, and pipelines will involve an increase in ground disturbing activities from operation-level activities, possibly leading to disturbance of suitable habitat for Ute ladies'-tresses in the area. Reclamation activities, unless adequate surveys to determine no Ute ladies'-tresses orchids are present, may result in the loss of individual plants or small populations of this orchid. To minimize these potential affects, reclamation efforts by the Bureau in previously suitable Ute ladies'-tresses habitat will include seeding of vegetation to produce suitable habitat for the Ute ladies'-tresses orchids.

Interrelated and Interdependent Effects: The highly interspersed surface and mineral ownership on the analysis area creates challenges for protection of the Ute ladies'-tresses orchid and suitable habitat. There will be some actions regarding non-Federal surface and/or minerals that would not occur but for a Federal action (i.e., they are interrelated or interdependent to the Federal action). Rights-of-way for access to non-Federal in holdings is an example of a common Federal action leading to interrelated and interdependent actions on non-Federal lands. Development of non-Federal minerals occurring as a result of a Bureau action would have the same effects on the Ute ladies'-tresses orchid as such development of Federal minerals, described above. To the extent that these actions are interrelated or interdependent to a Federal action, any effects to this orchid associated with development of non-Federal minerals must be considered prior to permit issuance or other authorization by the Bureau.

## **Mountain Plover**

Disturbance leading to loss of reproductive potential may occur in several ways. Effects to nesting plovers are likely depending on the onset, duration, and frequency of human disturbance. Aside from direct take of nests, chicks, and adults through vehicle collision, human disturbance may cause loss of eggs or chicks if attending mountain plover adults are displaced long enough to expose the eggs or chicks to excessive heating, chilling, or predation.

If disturbance occurs more frequently than weekly through the breeding season, nesting birds may be displaced and may initiate nests a secure distance from the disturbed area. While this may reduce the amount of nest failure from disturbance, it may nonetheless result in reduced plover reproduction if plovers are displaced to less suitable nesting areas. Indeed, significant amounts of previously occupied habitat may be made unavailable in this way. Preliminary data from the Foote Creek Rim suggest that breeding plovers may be displaced from areas of high human activity (WEST, Inc. 1999). Typical mountain plover habitat is level to slightly sloping ground usually associated with black-tailed prairie dog towns; these same areas are prime

locations for oil and gas development and CBM exploration and development in particular (BA For Coal Bed Methane Production in Montana (MT Assessment 2002)). Therefore, the Service assumes that a high percentage of development will occur in areas such as prairie dog colonies and mountain plover habitat (MT BA 2002). If nesting birds are displaced to nest in less suitable habitat where nesting success is lower, this would result in lost breeding potential. Additionally, nesting mountain plovers outside of the disturbance area may be displaced by the relocation of mountain plovers disturbed by drilling activities.

If disturbance begins after the onset of nesting or occurs at intervals greater than two weeks apart, birds may have already initiated nesting within the disturbance area. Then, human activity causing displacement of incubating adults from active nests may result in addling eggs due to extremes of temperature or destruction of eggs by predators. During incubation, the mountain plover is fairly insensitive to human disturbance from vehicles as close as 3 meters but may be displaced from the nest by a human on foot at a much greater distance. Eggs or newly hatched chicks may also be crushed by vehicle traffic at any speed. Additionally, the presence of dogs greatly increases the distance at which plovers leave their nests, thus exposing the eggs to predation, chilling, and other adverse effects (Knopf 2002a).

Human disturbance is especially problematic where human activity has created disturbed areas attractive to nesting mountain plovers. In Utah, mountain plovers have been found to nest as close as 6-meters from open roads or operating oil well pads (Ellison et al. 1999), presumably attracted by the abundance of bare soil. Creation of apparently suitable habitat with high levels of human disturbance may actually attract breeding plovers to an 'ecological trap' (Pulliam 1988) where nests are initiated but fail due to disturbance and reproductive effort is wasted.

Mountain plovers are attracted to roads (Knopf 2002b) and are known to lead broods onto roads to forage at night (Laun 1957, Ellison et al. 1999). Direct loss of chicks or even adults to vehicle collisions may increase where increasing traffic volumes correspond with concentrations of nesting and brood-rearing activity. The Bureau's commitment to establish 25 miles per hour speed limits on project roads within 0.5-mile of known nesting areas should help reduce the likelihood of such collisions. However, because the birds may freeze and squat close to the ground in response to approaching vehicles, some level of mortality is likely.

In addition to activities that may lead to direct mortality of adults or young, and reduced production, several factors may lead to indirect mortality. The eggs and young, and to a lesser extent adults, are susceptible to a number of avian and mammalian predators. These include corvids (ravens, magpies, crows), birds of prey (hawks and owls), coyotes, badgers, weasels (*Mustela* spp.), and foxes (*Vulpes* spp.). These predators may benefit from human activities in a number of ways. Power poles, fence posts, associated gas facilities, and other elevated structures may provide new hunting perches and nest sites for avian predators, increasing their hunting effectiveness and range. Buildings, trailers, and other permanent structures may provide safe den sites for mammalian predators. The Bureau's commitment to minimize hunting perches

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within 0.5-mile of nesting areas will help minimize potential adverse effects.

Finally, an increase in road-killed animals due to more roads and heavier traffic may provide an increased food supply for both avian and mammalian predators, most of which are also scavengers. This increased food source may increase predator population size and may also extend predators range into previously uninhabited areas, leading to higher rates of predation on mountain plover eggs, chicks, and even adults. Such an ecological relationship has been demonstrated in the Mojave Desert of California. Increases in roads and traffic have extended the range of avian predators such as the common raven (*Corvus corax*) and red-tailed hawk (*Buteo jamaicensis*) exposing young desert tortoises (*Gopherus agassizii*) to much higher rates of predation than before development (Knight et al. 1993, Knight and Kawashima 1993). The Bureau's commitment to establish 25 Miles per hour speed limits on project roads within 0.5 mile of known nesting areas should help reduce the availability of carrion to attract predators.

Mountain plovers show high site fidelity to breeding territories between years and the persistence of breeding concentrations may be more important than mere availability of apparently suitable habitat for the persistence of the mountain plover. The necessity of social facilitation for effective breeding has been demonstrated in a number of avian species. Habitat degradation occurring outside of the breeding season may cause take in the form of harm by causing abandonment of historically used breeding areas, though no direct take of plovers, eggs, or chicks occurs. Harm would result if removal or degradation of nesting habitat on historically used sites resulted in loss of breeding capability upon the birds' return, and/or resulted in loss of the pair for lack of available feeding or nesting habitat.

The key issue is whether or not birds displaced by project activities will move to new areas and successfully breed. Currently, information is inadequate to answer this question. While unoccupied areas meeting our understanding of suitable habitat exist, this could mean either that science has not accurately described suitable plover breeding habitat and these areas are not actually suitable, or that they are suitable and the mountain plover is currently not limited by availability of breeding habitat. Until the question is resolved the prudent management approach must be to identify and protect all breeding concentrations of the species.

**Specific phases of oil and gas development and the specific activities that may cause take are outlined below.**

Development: The construction of roads, well pads, and ancillary facilities that degrade habitat in historically used breeding areas could result in abandonment of these breeding areas, whether or not the construction occurs during the breeding season. Given the Bureau's existing commitment to survey for plovers and delay work either 37 days, or 7 days post-hatch if any mountain plover nests or broods are found within 1/4 mile of development, the likelihood of ground-disturbing activities (including construction of roads, well pads, pipelines, ancillary



facilities) causing direct lethal mortality of plovers would be diminished. However, human activity associated with project development and operation in historically used breeding areas may harass nesting birds enough to cause them to abandon the breeding area, particularly if disturbance extends over more than one breeding season. This could constitute harm to reproductive success. Additionally, increased traffic to and from other project construction sites may cause direct mortality through collisions with vehicles, and indirectly cause mortality by increasing predator numbers (by providing road-killed animals), thereby possibly increasing predation on adults, eggs, or chicks. However, it should be noted that the Bureau's commitment to post 25-miles per hour speed limits within 0.5-mile of identified nesting areas reduces the likelihood of such effects.

Drilling operations may displace breeding mountain plovers some distance from the pad, making additional nesting habitat unsuitable for some distance around the drill rig, and may constitute harassment. Traffic and risks of vehicle collision will greatly increase during drilling. Any of these factors that incrementally reduce the habitat quality leading to abandonment of a previously used breeding area, or reduced reproductive success, may constitute "incidental" take.

Operation: Though traffic will greatly decrease after construction, operating wells will still require periodic maintenance and visits, thereby maintaining low levels of impact associated with traffic and human activity. Elevated structures (such as power poles, water storage tanks, etc.) on the well pad could provide new nest and perch sites for corvids (i.e., common raven and black-billed magpie) and birds of prey, including ferruginous hawks (*Buteo regalis*), golden eagles, great horned owls (*Bubo virginianus*), and loggerhead shrikes. Presence of these known or suspected predators of mountain plovers and their eggs and chicks will increase the likelihood of mortality. The Bureau's commitment to minimize hunting perches within 0.5-mile of nesting areas will help minimize the effect. Maintenance of producing wells during the breeding season will occasionally produce levels of traffic, noise, and human activities that could lead to direct take of mountain plovers or displacement from the vicinity of the well pad. Recreational use of the new road system will cause increased disturbance and risk of vehicle collisions. Any of these factors that result in direct mortality of mountain plovers or that incrementally reduce the habitat quality leading to abandonment of a previously used breeding area or reduced reproductive success would constitute take.

Abandonment and Reclamation: Although the Bureau has committed to avoidance of mountain plover habitat where possible, and surveys in suitable habitat for mountain plovers where avoidance is not possible. Reclamation of drill pads, roads, and pipelines will involve an increase in traffic, noise, and human activity from operation-level activities, possibly leading to direct take as well as disturbance and displacement of nesting plovers in the area. Reclamation activities initiated during the breeding season, unless adequate surveys determine no birds are present, may crush eggs or chicks or lead to nest failure by displacing attendant adults. Placement of a marker to identify plugged wells may provide a permanent hunting perch for avian predators, increasing mortality risk to mountain plovers or displacing breeding birds from

suitable habitat. However, in the FBA and enclosed CM, the Bureau indicated that markers would be less than 4 feet tall with perch inhibiting devices on top, thus reducing these potential affects. In addition, reclamation efforts by the Bureau in previously suitable mountain plover habitat will include seeding of vegetation to produce suitable habitat for mountain plovers. Plant species that produce a long-lasting stand of tall, dense vegetation will preclude nesting by mountain plovers as long as that vegetation persists.

Interrelated and Interdependent Effects: The highly interspersed surface and mineral ownership on the analysis area creates challenges for protection of mountain plovers and their habitats. There will be some actions regarding non-Federal surface and/or minerals that would not occur but for a Federal action (i.e., they are interrelated or interdependent to the Federal action). Rights-of-way for access to non-Federal in holdings is an example of a common Federal action leading to interrelated and interdependent actions on non-Federal lands. Development of non-Federal minerals occurring as a result of a Bureau action would have the same effects on nesting plovers or historically used breeding areas as such development of Federal minerals, described above. To the extent that these actions are interrelated or interdependent to a Federal action, any effects to mountain plovers associated with development of non-Federal minerals must be considered prior to permit issuance or other authorization by the Bureau.

## **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The cumulative effects are difficult to quantify for several reasons. Because surface ownership within the project area is primarily private and approximately half the oil and gas rights are privately owned, many new wells and many miles of roads, pipelines and power lines are reasonably certain to occur on private lands with no Federal nexus. This is evidenced by the current and historic rates of CBM development on private land throughout the Powder River Basin. The DEIS identifies 12,077 CBM wells already drilled or permitted for drilling on private surface/private minerals within the project area. Since publication of the DEIS the number of CBM wells already drilled or permitted for drilling on private surface/private minerals within the project area has risen to 14,116 CBM wells (Litwartz 2002). Therefore, we anticipate that future CBM development will continue. However, some of the gas development activities on non-Federal land will require grants of right-of-way from the Bureau for access and are, therefore, interrelated and interdependent to the right-of-way grants. These grants and interrelated and interdependent actions constitute Federal actions subject to review under section 7 of the Act and therefore are not considered under cumulative effects.

Four to six new power generation plants and connecting high voltage distribution lines have been proposed for the Powder River Basin. However, at this time it is unclear how many of these

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power plants and distribution lines will actually be built. Furthermore, it is unclear if there will be section 7 consultation for these projects. North American Power Group contends that the Two Elk power plant, if constructed as proposed, would not require section 7 consultation. Regardless, the construction of powerplants, infrastructure and high voltage distribution lines would result in additional loss of wildlife habitat and additional mortality of raptors and bald eagles in particular from collisions with power lines and electrocutions.

Finally, the data are not adequate to determine the distribution and abundance of the bald eagle, Ute ladies'-tresses, or mountain plover on private lands in the project area. Likewise, there are no accurate estimates of suitable habitat for these species on private lands, though such habitat likely occurs throughout the area. For this reason, the extent of cumulative effects to the species is difficult to quantify. However, given the surface and gas ownership patterns, as well as the current level of development of this private CBM, the direct and indirect effects of these private actions are likely to adversely affect the species addressed in this opinion in a similar manner and to a similar degree as those Federal actions addressed in this opinion.

## **CONCLUSION**

### **Bald Eagle**

After reviewing the current status of the bald eagle; the environmental baseline for the action area; the effects of the Powder River Basin Oil and Gas Project; and the cumulative effects, it is the Service's biological opinion that the direct and indirect effects of the Powder River Basin Oil and Gas Project, as proposed, are not likely to jeopardize the continued existence of the bald eagle. No critical habitat has been designated for this species, therefore, none will be affected.

The Service has reached this conclusion by considering the following:

1. The bald eagle has experienced significant recovery across its range since the banning of DDT.
2. The project area encompasses a relatively small amount of the bald eagle's entire range.
3. The project area supports 10 active bald eagle nests. However, the Bureau has committed to a 1-mile buffer for all active bald eagle nests.
4. A relatively small number of roosts sites will potentially be adversely affected by the project.
5. Construction, the activity most likely to adversely affect the birds, will be of a short duration and minimized by spacial and timing stipulations.

### **Ute Ladies'-tresses**

After reviewing the current status of the Ute ladies'-tresses; the environmental baseline for the action area; the effects of the Powder River Basin Oil and Gas Project; and the cumulative

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effects, it is the Service's biological opinion that the direct and indirect effects of the Powder River Basin Oil and Gas Project, as proposed, are not likely to jeopardize the continued existence of the Ute ladies'-tresses. No critical habitat has been designated for this species, therefore, none will be affected.

The Service has reached this conclusion by considering the following:

1. Given the general characteristics of the project area, it is likely any suitable habitat or populations of Ute ladies'-tresses are relatively scattered and small.
2. While the project area is relatively large, it is not part of one of the three major areas of known Ute ladies'-tresses concentrations.
3. There is only one small population known to exist within the project area.
4. The Bureau has committed to avoidance of suitable habitat where possible and surveys for the plant if avoidance of suitable habitat is not possible.

### **Mountain Plover**

After reviewing the current status of the mountain plover; the environmental baseline for the action area; the effects of the CBM development in the project area; and the cumulative effects, it is the Service's conference opinion that the direct and indirect effects of the Powder River Basin Oil and Gas Project are not likely to jeopardize the continued existence of the mountain plover. No critical habitat has been proposed for this species, therefore, none will be affected.

The Service has reached this conclusion by considering the following:

1. Mountain plovers are widely distributed throughout their breeding range, with the current population estimated at 10,000 individuals (USFWS 1999). The loss of relatively few individuals or nests would be a relatively minor impact on the population.
2. Habitat for the plover is present, but highly scattered throughout the project area
3. The Bureau has committed to avoidance of suitable habitat where possible and surveys for mountain plovers if avoidance of suitable habitat is not possible.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which

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include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Bureau so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Bureau has a continuing duty to regulate the activity covered by this incidental take statement. If the Bureau (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Bureau must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR 402.14(i)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants is provided to the extent that the Act prohibits the removal and reduction to possession of Federally listed plants, the malicious damage of endangered plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

For the mountain plover, the prohibitions against taking the species found in section 9 of the Act do not apply until the species is listed. However, the Service advises the Bureau to consider implementing the following reasonable and prudent measures as they pertain to the mountain plover. If this conference opinion for the mountain plover is adopted as a biological opinion following a listing or designation, these measures, with their implementing terms and conditions, will be nondiscretionary.

## **AMOUNT OR EXTENT OF TAKE**

### **Bald Eagle**

The Service anticipates that up to four bald eagles may be killed as a result of electrocution/collision with power lines or power poles and/or killed in collisions with vehicles as the bald eagles are foraging along project roads over the 20-year life of the Powder River Basin Oil and Gas Project. Based on the Bureau's commitment to implement the conservation measures as described in the project description section of the Bureau's FBA, the Service does not anticipate a higher level of take of bald eagles over the life of the project. Additionally, proactive measures by Powder River Energy Corporation (PREC) such as a commitment that all

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their new power lines will be built to raptor proof guidelines, actively upgrading existing lines to raptor proof standards and providing their distribution line specifications to CBM developers in the Powder River Basin will further minimize the possibility of bald eagles being accidentally electrocuted (Mignery 2002).

The Service anticipates the loss of one additional roosting area over and above the incidental take issued for the Wyodak Coal Bed Methane Project, and Wyodak Coal Bed Methane Drainage Project. This increased level of take is a consequence of the additional disturbance associated with development and operation of the Powder River Basin Oil and Gas Project. This anticipated take is in addition to that anticipated in the biological opinions for the Wyodak Coal Bed Methane Project, and Wyodak Coal Bed Methane Drainage Project.

In our November 20, 2000, biological opinion addressing the Wyodak Coal Bed Methane Project (5,000 wells), the Service anticipated one bald eagle could be lethally taken as a result of vehicular collision and one roosting area could be lost as a consequence of increased disturbance. The Service's March 9, 2001, biological opinion addressing the Wyodak Coal Bed Methane Drainage Project (2,500 wells) anticipated an increased likelihood of take, over and above the take anticipated in the November 20, 2000, biological opinion. However, the Service did not believe the likelihood of take would increase significantly enough to warrant increasing the number of eagles or roost sites anticipated to be lost.

Given the additional disturbance associated with the Powder River Basin Oil and Gas Project (greater than five times the disturbance associated with the Wyodak Coal Bed Methane and Wyodak Coal Bed Methane Drainage Projects combined) the Service believes that the increased likelihood of take, over and above that anticipated in the above mentioned biological opinions warrants increasing the number of bald eagles anticipated to be lost. However, with three overlapping project areas, it may be difficult to discern which project actually resulted in the take. Because the required bald eagle habitat loss monitoring information was not collected for the Wyodak Coal Bed Methane and Wyodak Coal Bed Methane Drainage Projects, the Service cannot quantify the extent of take, if any, that may have occurred during implementation and operation of these two projects.

### **Mountain Plover**

The Service anticipates up to 2 mountain plovers (adult or chick), per year could be taken as a result of collisions with vehicles. This level of expected mortality will result from vehicular collision while the adult and chicks are foraging along roads. The likelihood of vehicle collision is highest during development but remains elevated through operation and abandonment. Additionally, destruction of nests could result from vehicle traffic on an infrequent basis as mountain plovers are attracted to linear features, such as roads (Deibert 2002). Given the estimated number of new improved roads (7,135 miles) and two-tracks (10,619 miles) proposed for this project, there will likely be some direct mortality as a result of collision with vehicles. This level of take is anticipated annually, not cumulatively, over the 20 year life of the project.

Additional incidental take is expected to be in the form of indirect lethal take associated with displacement of adults from nests or broods long enough to cause take of eggs or chicks through exposure to the elements or predators, especially if people will be nearby on foot for many hours. In addition, displacement of breeding birds from known nesting areas to less suitable nesting habitat may occur due to habitat alteration and cause harm through reproductive failure. Human activity associated with project development and ongoing operation may also cause displacement and could cause take in the form of harassment. Where development increases predator abundance or efficiency, nesting plovers may be displaced to nest in less suitable habitat. The Service anticipates up to 3 percent (6,720 acres) of occupied mountain plover habitat could be

lost as a result of all actions associated with the Powder River Basin Oil and Gas Project. This level of take is anticipated to occur primarily during the development phase of this project (10 years) but covers the 20 year life of the project.

Incidental take is expected to be in the form of both direct lethal take of adult mountain plovers and their chicks, and indirect lethal take in the form of harm through modification of breeding and brooding behavior, and loss of nesting and brood rearing habitat.

The above mentioned level of indirect lethal take of this species can be anticipated by the loss of 3 percent (6,720 acres) of the occupied mountain plover habitat as a surrogate measure of take for the following reasons: the lack of current mountain plover distribution data on the analysis area; take of individuals may be difficult to detect when the species is wide-ranging; the dispersed nature of breeding birds; the small body size and cryptic nature of eggs and chicks; the rapidity with which dead or impaired specimen may be quickly removed by predators/scavengers; and difficulty of measuring increased mortality of adults, eggs or chicks as a result of increased predator abundance.

Information on the distribution and abundance of the mountain plover on the analysis area is currently inadequate to determine the actual number and density of mountain plovers that may be affected by the proposed action. Furthermore, actual site-specific details of development activities are not provided in the project description. Because the required mountain plover habitat loss monitoring information was not collected for the Wyodak Coal Bed Methane and Wyodak Coal Bed Methane Drainage Projects, the Service cannot quantify the extent of take, if any, that may have occurred during implementation and operation of these two projects. Without information on the amount of take associated with these two projects it is difficult to estimate the level of anticipated take that may occur from implementation and operation of the Powder River Basin Oil and Gas Project. However, we do know that short term disturbance would include about 3 percent of the analysis area (DEIS. Pg. 2-10).

Of the approximately 8,000,000 acres included in the analysis area roughly 4,230,073 acres (53 percent of the analysis area) is unsuitable habitat for mountain plovers because of vegetation types that preclude mountain plover use (eg. coniferous forest, riparian mixed-grass, etc. Table

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3-15, DEIS 2001). Of the remaining vegetation types (3,769,927 acres) additional areas can be eliminated from consideration as suitable habitat for mountain plovers because of vegetation height, slope or topographic features.

To estimate the amount of occupied habitat within the analysis area we used a spatially-explicit model developed by Beauvais and Smith (*In Press.*) for identifying breeding habitat for mountain plovers in western Wyoming. This model predicts the probability of the presence of breeding mountain plovers as a function of vegetation structure and slope. Although the model was developed specifically for western Wyoming, it's conclusions generally apply to eastern Wyoming as well. Thus it is currently the best way to estimate the loss of occupied mountain plover habitat associated with this project. We defined occupied habitat as all areas predicted by the model to have a probability of mountain plover presence of greater than or equal to 75 percent. Based on the Authors' experience using this model, a predicted probability value of 75 percent includes almost all occupied mountain plover habitat (Beauvais 2002). Ground truthing this model for use in the Powder River Basin the authors used a predicted probability of 80 percent in the area north of Wheatland, Wyoming, the Shirley Basin and Cyclone Rim, within the Bureau's Rawlins Field Office. When validating this model with independent data from across Wyoming the model correctly classified 87 percent of the points used in the data set (Beauvais and Smith *In Press.*). Applying this model to the Powder River Basin Oil and Gas Project area, an estimated 2.8 percent (224, 000 acres) of the analysis area is occupied mountain plover habitat. For the purpose of this Biological and Conference Opinion the Service defines occupied habitat as areas where mountain plover nesting has been confirmed by surveys conducted in accordance with the Service's Mountain plover guidelines or other Service approved techniques.

## **EFFECT OF THE TAKE**

### **Bald Eagle**

In the accompanying biological opinion, the Service determined that this level of anticipated take of the bald eagle is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

### **Mountain Plover**

In the accompanying conference opinion, the Service determined that this level of anticipated take of mountain plovers is not likely to result in jeopardy to the species or destruction or adverse modification of proposed critical habitat.

## **REASONABLE AND PRUDENT MEASURES**

The Service believes the following reasonable and prudent measures (RPM) are necessary and appropriate to minimize impacts of incidental take of bald eagles and mountain plovers.



### **Bald Eagle and Mountain Plover**

- RPM1. The Bureau shall ensure implementation of all conservation measures identified and committed to as part of the action (outlined above in Project Description and more fully described throughout the September 3, 2002, FBA).
- RPM2. The Bureau shall ensure direct habitat disturbance does not exceed that discussed in the FBA and evaluated in this Biological/Conference Opinion. Through minimization and monitoring of direct habitat disturbance, indirect disturbance to the species will also be minimized.

### **Bald Eagle**

- RPM3. Reduce the possibility of vehicular collision with bald eagles, including reducing the amount of carrion present as a result of vehicular collision to discourage foraging by bald eagles.
- RPM4. Reduce the possibility of electrocutions of bald eagles.
- RPM5. Reduce the likelihood of disruption of nesting and roosting activities.

### **Mountain Plover**

The following reasonable and prudent measures are designed first to avoid direct impacts to nesting mountain plovers through activity-specific nest searches, and second, to avoid or minimize impacts to known nesting aggregations by 1) avoiding or minimizing direct and indirect take of adults, eggs, or chicks on these areas, and 2) avoiding the abandonment of nesting aggregation areas.

- RPM6. Minimize indirect disturbance to the species through minimization and monitoring of direct habitat disturbance.
- RPM7. The Bureau shall locate nesting areas and prevent direct take and indirect take within them.
- RPM8. The Bureau shall work to avoid abandonment of nesting areas.
- RPM9. The Bureau shall reduce the possibility of vehicular collisions with mountain plovers.
- RPM10. The Bureau shall limit project-related features that increase the population levels or hunting efficiency of predators of the mountain plover in the vicinity of known plover

nest sites.

- RPM11. Operators and Bureau employees shall be shown how to identify the mountain plover and provided information about its habitat requirements, natural history, status, threats, and possible impacts of gas development activities. Incidental observations of mountain plovers shall be solicited from all operator and Bureau field personnel.

## TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Bureau must comply with the following terms and conditions (T&C), which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

### All Species

- T&C1. In the event that a bald eagle (dead or injured) or mountain plover (dead or injured) is located during construction and operation, the Service's Wyoming Field Office (307-772-2374) and the Service's Law Enforcement Office (307-261-6365) will be notified within 24 hours. The action agency must provide for monitoring the actual number of individuals taken. Because of difficulty in identification, all small birds found dead should be stored in a freezer for the Service to identify.
- T&C2. The Bureau shall monitor all loss of (1) bald eagle (nesting and roosting habitat as defined in the status of the species section of his Biological and Conference Opinion) and (2) suitable mountain plover habitat associated with all actions covered under the DBA; the *Draft Statement and Draft Planning Amendment for the Powder River Basin Oil and Gas Project*, the revised FBA dated September 3, 2002, the *Final Statement for the Powder River Basin Oil and Gas Project*, and the ROD for this project. The actual measurement of habitat loss can be the responsibility of the Bureau or Bureau's agent (consultant, contractor, etc.) with a written summary provided to the Service's Wyoming Field Office semi-annually, or immediately if the Bureau determines that a site specific project proposed under the Powder River Basin Oil and Gas Project (*i.e.* Application for Permit to Drill/POD, Right-of-way grants, or Sundry Notices) will adversely affect a listed species. The tracking will include the location and acres of habitat loss, field survey reports, what stipulations were applied, and a record of any variances granted to timing and/or spatial buffers. For the purposes of this biological opinion, habitat loss is defined as the permanent or

- temporary alteration of habitat in such a way as to displace a species into unsuitable areas or impair/disrupt or prevent normal behavioral patterns such as breeding, feeding or sheltering. The monitoring of habitat loss for these species will commence from the date the ROD is signed. It is the responsibility of the Bureau to ensure that semi-annual reports are complete and filed with the Service in a timely manner. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the FEIS for the Powder River Basin Oil and Gas Project and ROD. The semi-annual reports will include all actions completed under this biological and conference opinions up to 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and thereafter on the anniversary dates of the signing of the ROD and 6 months after the signing of the ROD. Reporting will continue for the life of the project.
- T&C3. The Bureau will initiate informal section 7 consultation with the Service when 50 percent of the allowed incidental take has occurred for either the bald eagle or the mountain plover to determine if additional measures need to be implemented to further minimize the potential for take of listed species.
- T&C4. The Bureau shall require implementation of all conservation measures/mitigation measures for all species identified in the revised FBA prepared for the project and dated September 3, 2002, the FEIS for the Powder River Basin Oil and Gas Project, and the ROD. These measures are identified in the DESCRIPTION OF PROPOSED ACTION section of this Biological and Conference Opinion.
- T&C5. The Bureau shall monitor for compliance with all Terms and Conditions.

### **Bald Eagle**

- T&C6. Power lines will be built to standards identified by the Avian Power Line Interaction Committee (1996) to minimize electrocution potential. Moreover, power lines will be built according to the additional specifications listed below. The Bureau will ensure that these additional standards to minimize bald eagle mortalities associated with utility transmission lines, will be incorporated into the stipulations for all project actions (*i.e.* Application for Permit to Drill/POD, Right-of-way grants, or Sundry Notices). It should be noted that these measures vary in their effectiveness to minimize mortality, and may be modified as they are tested in the field and laboratory. Local habitat conditions should be considered in their use. The Service does not endorse any specific product that can be used to prevent and/or minimize mortality, however, we are providing a list of *Major Manufacturers of Products to Reduce Animal Interactions on Electrical Utility Facilities*. The following represents areas where bald eagle protection measures will be applied when designing/constructing new distribution lines or modifying existing facilities:

For new distribution lines and facilities:

- A. Bury distribution lines where feasible.
- B. Raptor-safe structures (e.g., with increased conductor-conductor spacing) are to be used that provide adequate spacing for bald eagles (i.e. minimum 60" for bald eagles).
- C. Equipment installations (overhead service transformers, capacitors, reclosers, etc.) are to be made bald eagle safe (e.g., by insulating the bushing conductor terminations and by using covered jumper conductors).
- D. Jumper conductor installations (e.g. corner, tap structures, etc.) are to be made bald eagle safe by using covered jumpers or providing adequate separation.
- E. Employ covers for arrestors and cutouts, when necessary.
- F. Lines should avoid high avian use areas such as wetlands, prairie dog towns, and grouse leks.

For modification of existing facilities:

- A. Existing structures, such as dead ends, tap or junction poles, transformers, reclosers and capacitor banks or other structures with less than 60" between conductors or a conductor and ground will need to be retrofitted to provide adequate spacing for bald eagles (i.e. minimum 60" for bald eagles).
- B. Cover exposed jumpers
- C. Gap any pole top ground wires
- D. Isolate grounded guy wires (install insulating link)
- E. On transformers, install insulated bushing covers, covered jumpers, and cutout covers and arrestor covers, if necessary
- F. If bald eagle mortalities occur on existing lines and structures, bald eagle protection measures are to be applied (e.g. modify for raptor-safe construction, install safe perches or perching deterrents, nesting platforms or nest deterrent devices, etc.)
- G. In areas where midspan collisions are a problem, install line-marking devices that have been proven effective. All transmission lines that span streams and rivers, should maintain proper spacing and have markers installed.

- T&C7. A minimum year-round disturbance-free buffer zone (no surface occupancy (NSO)) of 0.5 mile will be established for all bald eagle nests. An alternative would be development of a site management plan, as discussed in the *GYBEWG* and the *MBEWG*, by the Bureau (with the cooperation and approval of the Service) for each bald eagle nest or winter roost site. Each site management plan will include the following zones: Zone 1 (Occupational Nesting Zone), Zone 2 (Primary use areas),

and Zones 3 (home ranges). The Bureau will restrict and monitor the types of activities to occur within each of these zones. No surface occupancy or use is allowed within 0.5 miles of known bald eagle nest sites which have been active within the past 5 years.

- T&C8. A seasonal disturbance-free buffer zone of 1 mile will be established for all bald eagle nests (February 15 - August 15). This buffer zone and timing may be adjusted based on site specific information through coordination with and with written concurrence of the Service's Wyoming Field Office.
- T&C9. A year-round disturbance-free buffer zone of 0.5 mile will be established for all bald eagle roost sites. This buffer zone restriction may be adjusted based on site specific information through coordination with and with written concurrence of the Service's Wyoming Field Office.
- T&C10. An additional seasonal buffer zone of 0.5 mile will be established for all bald eagle roost sites (November 1 - April 1). This buffer zone will start at the outside boundary of the 0.5 mile year-round disturbance-free buffer zone and extend out an additional 0.5 mile. However, within this seasonal buffer zone less restrictive measures such as remote monitoring of wells and/or restricting well maintenance visitations or human activity critical to project operations to between 9:00 AM and 3:00 PM may be allowed after coordination with the Service's Wyoming Field Office and a demonstration that measures more protective of bald eagles are not reasonable or feasible.
- T&C11. Nest productivity monitoring will be conducted by the Bureau or a Bureau-approved biologist in areas with high levels of development (i.e., areas with greater than or equal to 4 well pads/section) within 1 mile of a bald eagle nest between March 1 and mid-July to determine nesting success (i.e., number of nestlings/fledglings per nest).
- T&C12. Appropriately-timed surveys for active bald eagle nests and winter roost sites will be conducted within 1 mile of proposed actions prior to permit (*i.e.* Application for Permit to Drill/POD, Right-of-way grants, or Sundry Notices) approval.

### **Mountain Plover**

- T&C13. A seasonal disturbance-free buffer zone of 0.25 mile will be maintained around all active mountain plover nest sites outside of black-tailed prairie dog towns between March 15 and July 31.

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- T&C14. Disturbance to prairie dog towns will be avoided where possible. Mountain plover nests on prairie dog towns will have a year-round disturbance-free buffer zone of 0.25 mile once nesting has been confirmed. An exception may be granted by the authorized officer only after the Bureau consults with the Service's Wyoming Field Office on a case by case basis and the operator agrees to adhere to any new operational constraints recommended by the Service.
- T&C15. Habitat suitability surveys will be conducted by a Bureau biologist or Bureau approved biologist prior to permit (*i.e.* Application for Permit to Drill/POD, Right-of-way grants, or Sundry Notices) approval.
- T&C16. Surveys for nesting mountain plovers will be conducted by a Bureau biologist or Bureau approved biologist if ground disturbing activities are anticipated to occur in suitable habitat between April 10 and July 10. The earlier date will facilitate detection of early-breeding plovers. Surveys will follow the most current version of the Service's Mountain Plover Survey Guidelines (USFWS 2002 or most current version).
- T&C17. Roads will be located outside of nesting plover habitat wherever possible. Maximum allowed travel speed on roads within 0.5 mile of identified mountain plover nesting areas shall not exceed 25 miles per hour from March 15 to July 31.
- T&C18. Creation of raptor hunting perches will be avoided within 0.5-mile of identified nesting areas. Where artificial hunting perches are created within 0.5-mile of identified nesting areas perch inhibitors will be installed to deter avian predators from preying on mountain plovers and nests.
- T&C19. Native seed mixes will be used to re-establish short grass prairie vegetation during reclamation.
- T&C20. No ground-disturbing activities shall occur in suitable nesting habitat prior to surveys conducted in compliance with the Service's 2002 Mountain Plover Survey Guidelines (attached) regardless of the timing of the disturbance. Once occupied mountain plover nesting habitat is located, the Bureau shall reinitiate section 7 consultation with the Service on any project-related activities proposed for such habitat or within 0.25-mile of such habitat. The amount and nature of ground-disturbing activities shall be limited within and adjacent to identified nesting areas in a manner to avoid the abandonment of these areas.
- T&C21. There will be No Surface Occupancy (NSO) of ancillary facilities (e.g. compressor stations, processing plants, etc.) within 0.5 mile of known nesting areas. Variance

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may be granted only after consultation with and agreement of the Service.

- T&C22. Work schedules and shift changes should be set to avoid the periods from one-half hour before to one-half hour after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.
- T&C23. No dogs will be permitted at work sites to reduce the potential for harassment of plovers.
- T&C24. The Service will provide the Bureau and operators with educational material illustrating and describing the mountain plover, its habitat needs, life history, threats, and gas development activities that may lead to incidental take of eggs, chicks, or adults. The Bureau and operators shall ensure these material are posted in common areas and circulated in a memorandum among all employees and service providers.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Bureau must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Note: Incidental take coverage for the mountain plover does not occur until the mountain plover is listed as a threatened species. The mountain plover is currently protected by the Migratory Bird Treaty Act. Therefore, take of this migratory bird is prohibited, **the issuance of this conference opinion notwithstanding.**

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations (CR) are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- CR1. Develop programmatic standards and guidelines to be incorporated into Land Use Plan amendments or revisions for all future actions related to oil and gas development. Conservation measures should apply to all phases of oil and gas development, including operations and maintenance activities.

- CR2. To improve bald eagle nesting and roosting habitat cottonwood regeneration should be encouraged within the project area through reduction, modification and/or removal of domestic grazing, recreational use, or mineral extraction, if those activities are identified as being a cause of lack of regeneration.
- CR3. Road-killed animals (excluding migratory birds) should be promptly removed from areas within 0.5-mile of identified mountain plover nesting areas. Removing carrion from or near roads as soon as possible would minimize the possibility of vehicular collision with bald eagles foraging on or near roads and to avoid attracting avian and mammalian predators of mountain plover.
- CR4. Surveys of the entire project area should be conducted for mountain plovers (both nesting and brood rearing activities) to provide an estimate of population numbers in the area and availability of suitable habitat, and impacts of CBM development on this species.
- CR5. Conduct research to better understand the effects of oil and gas development on breeding mountain plovers. The focus of research should be to measure recruitment to the fall population, philopatry, and site fidelity between developed and undeveloped mountain plover breeding concentration areas on or near the project area. This effort would require close monitoring of a large sample of breeding adults, and possibly color-marking or radio-marking adults and juveniles.
- CR6. Mountain plover display high site fidelity and their long term absence from an area may preclude natural re-occupation of suitable habitat. If long term monitoring does not document any significant numbers of mountain plover in suitable habitat in the project area, translocate young mountain plover to unoccupied habitat to attempt re-establishment of local populations. Monitor marked birds to determine success of translocation.
- CR7. Surveys of all suitable habitat within the project area and all adjacent drainages should be conducted for Ute ladies'-tresses to determine the status and distribution of this species in the general vicinity.
- CR8. Re-establish prairie dog colonies in reclaimed or suitable habitat for nesting mountain plovers by translocating prairie dogs from occupied colonies within the area.
- CR9. Utilize remote monitoring technology to reduce site visits to well pads and ancillary facilities thereby, reducing wildlife disturbances and mortalities.



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In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

### **REINITIATION NOTICE**

This concludes formal consultation and conferencing on the actions outlined in the December 2001, Assessment and September 3, 2002, FBA regarding the Powder River Basin Oil and Gas Project in Campbell, Converse, Johnson, and Sheridan counties, Wyoming. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the mountain plover is listed. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After listing of the mountain plover as endangered or threatened and any subsequent adoption of this conference opinion, the Bureau shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The portion of the incidental take statement addressing the mountain plover provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the mountain plover has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the mountain plover may occur between the listing of the mountain plover and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

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Thank you for your assistance in the conservation of endangered, threatened, and proposed species. If you have any questions or comments on this biological opinion or your responsibilities under the Act, please contact Bradley Rogers at the letterhead address or by phone at (307) 772-2374, extension 25. In your response, please refer to (W.02/WY6633(ES-6-WY-02-F006)).

#### Attachments (2)

cc:           Statewide Habitat Coordinator, WGFD, Cheyenne, WY  
              Non-game Coordinator, WGFD, Lander, WY  
              J. Levin, State Of Wyoming, Cheyenne, WY  
              Bureau of Land Management, Cheyenne, WY  
              Susan Linner, R6 Regional Office, FWS, Denver, CO  
              Field Supervisor, FWS, Helena, MT

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**MOUNTAIN PLOVER SURVEY GUIDELINES**  
**U.S. Fish and Wildlife Service**  
**March 2002**

The mountain plover (*Charadrius montanus*) is a small bird (17.5 cm, 7 in.) about the size of a killdeer (*C. vociferus*). It is light brown above with a lighter colored breast, but lacks the contrasting dark breast-belt common to many other plovers. During the breeding season it has a white forehead and a dark line between the beak and eye, which contrasts with the dark crown.



Mountain plover breeding habitat includes short-grass prairie and shrub-steppe landscapes; dryland, cultivated farms; and prairie dog towns. Plovers usually nest on sites where vegetation is sparse or absent, conditions that can be created by herbivores, including domestic livestock and prairie dogs. Vegetation in shortgrass prairie sites is typically less than 4 inches tall. Nest sites within the shrub-steppe landscape are also confined to areas of little to no vegetation, although surrounded by areas visually dominated by shrubs. Commonly, nest sites within shrub-steppe areas are on active prairie dog towns. Nests are commonly located near a manure pile or rock. In addition to disturbance by prairie dogs or livestock, nests have also been found on bare ground created by oil and gas development activities, and on dryland, cultivated agriculture in the southern part of their breeding range. Mountain plovers are rarely found near water. Positive indicators for mountain plovers therefore include level terrain, prairie dogs, bare ground, *Opuntia* pads, cattle, widely spaced plants, and horned larks. It would be unusual to find mountain plovers on sites characterized by irregular or rolling terrain; dense, matted vegetation; grass taller than 4 inches, wet soils, or the presence of killdeer.

These guidelines were developed by Service biologists and Dr. Fritz Knopf, USGS-BRD. Keep in mind these are guidelines - please call the local Fish and Wildlife Service, Ecological Services office, if you have any suggestions.

**GENERAL GUIDELINES FOR SURVEYS**

On February 16, 1999, the Service proposed the mountain plover for federal listing as threatened. Because listing of this species is proposed, the Service may recommend surveys for mountain plovers to better define nesting areas, and minimize potential negative impacts. The Service may recommend surveys for mountain plovers in all suitable habitat, as well as avoidance of nesting areas, to minimize impact to plovers in a site planned for development. While the Service believes that plover surveys, avoidance of nesting and brood rearing areas, and timing restrictions (avoidance of important areas during nesting) will lessen the chance of direct impacts to and mortality of individual mountain plovers in the area, these restrictions do nothing to mitigate indirect effects, including changes in habitat suitability and habitat loss. Surveys are, however, a necessary starting point. The Service has developed the following 3 survey

guidelines, depending on whether the intent is to determine the presence or absence of plovers at a site during the nesting season for permanent and short term projects, or to determine the density of nesting plovers at known nesting sites.

## **Survey Protocol**

Surveys for mountain plovers are conducted during the period where the highest numbers of plovers are likely to be tending nests and territories, and therefore are most likely to be detected. Throughout their range, these dates are generally from May 01 through June 15. However, seasonal restrictions for ground disturbing activities in suitable mountain plover nesting habitats are usually longer than the survey dates. The longer seasonal restrictions allow for protection of early nesting birds, and very young chicks which tend to sit still to avoid detection during the first week post-hatch. Since specific nesting dates across the breeding range of the plover vary according to latitude and local weather, the project proponent or the land management agency should contact the local U.S. Fish and Wildlife Service Office to determine what seasonal restrictions apply for specific projects.

Two types of surveys may be conducted: 1) surveys to determine the presence/absence of breeding plovers (i.e., displaying males and foraging adults), or 2) surveys to determine nest density. The survey type chosen for a project and the extent of the survey area (i.e., beyond the edge of the construction or operational ROW) will depend on the type of project activity being analyzed (e.g., construction, operation) and the users intent. One methodology outlines a breeding survey that was used in northeastern Colorado to establish the density of occupied territories, based on displaying male plovers or foraging adults. The other was developed to only determine whether plovers occupy an area.

## **Techniques Common to Each Survey Method**

- Conduct surveys during early courtship and territorial establishment. Throughout the breeding range, this period extends from approximately mid-April through early July. However, the specific breeding period, and therefore peak survey days, depends on latitude, elevation, and weather.
- Conduct surveys between local sunrise and 1000 and from 1730 to sunset (periods of horizontal light to facilitate spotting the white breast of the adult plovers).
- Drive transects within the project area to minimize early flushing. Flushing distances for mountain plovers may be within 3 meters for vehicles, but plovers often flush at 50 to 100 meters when approached by humans on foot.
- Use of a 4-wheel drive vehicle is preferable where allowed. Use of ATVs has proven highly successful in observing and recording displaying males.

Always seek guidance from land management agencies regarding use of vehicles on public lands, and always obtain permission of private landowners before entering their lands.

- Stay in or close to the vehicle when scanning. Use binoculars to scan and spotting scopes to confirm sightings. Do not use scopes to scan.
- Do not conduct surveys in poor weather (i.e., high wind, precipitation, etc.).
- Surveys conducted during the courtship period should focus on identifying displaying or calling males, which would signify breeding territories.
- For all breeding birds observed, conduct additional surveys immediately prior to construction activities to search for active nest sites.
- If an active nest is located, an appropriate buffer area should be established to prevent direct loss of the nest or indirect impacts from human-related disturbance. The appropriate buffer distance will vary, depending on topography, type of activity proposed, and duration of disturbance. For disturbances including pedestrian foot traffic and continual equipment operations, a 1/4 mile buffer is recommended.

## **SURVEY TO DETERMINE PRESENCE/ABSENCE**

### **Large scale/long term projects**

1. Conduct the survey between May 1 and June 15, throughout the breeding range.
2. Visual observation of the area should be made within 1/4 mile of the proposed action to detect the presence of plovers. All plovers located should be observed long enough to determine if a nest is present. These observations should be made from within a stationary vehicle, as plovers do not appear to be wary of vehicles. Because this survey is to determine presence/absence only, and not calculate statistical confidence, there is no recommended distance interval for stopping the vehicle to scan for birds. Obviously numerous stops will be required to conduct a thorough survey, but number of stops should be determined on a project and site-specific basis.
3. If no visual observations are made from vehicles, the area should be surveyed on ATV's. Extreme care should be exercised in locating plovers due to their highly secretive and quiet nature. Surveys by foot are not recommended because plovers tend to flush at greater distances when

approached using this method. Finding nests during foot surveys is more difficult because of the greater flushing distance.

4. A site must be surveyed 3 times during the survey window, with each survey separated by at least 14 days. The need for 3 surveys is to capture the entire nesting period, with the intent of reducing the risk of concluding the site is not nesting habitat by an absence of nesting birds during a single survey.
5. Initiation of the project should occur as near to completion of the survey as possible. For example, seismic exploration should begin within 2 days of survey completion. A 14 day period may be appropriate for other projects.
6. If an active nest is found in the survey area, the planned activity should be delayed 37 days, or seven days post-hatching. If a brood of flightless chicks is observed, activities should be delayed at least seven days.

### **Short-term, linear projects**

The Service recognizes that many projects have minimal, if any impact on mountain plover nesting habitat, and that these projects may only be present in suitable habitat for a day or less. In order to address concerns from project proponents about delays associated with mountain plover surveys for these projects, the Service has developed the following guidelines. However, the Service encourages the project proponent to plan these projects so that all work occurs outside the plover nesting season.

Short-term linear projects are defined as projects which move through an area within the course of a day and result in no permanent habitat alteration (e.g., vegetative/topographic changes), and no permanent project-related above ground features. Short-term, linear projects may include activities such as pipelines (4 inch diameter or less), fiber optic cables, and seismic exploration. For these projects, all ROW surveying/staking activities should be completed before April 1 to avoid discouraging plovers from nesting in suitable habitat. If ROW surveying cannot be completed before April 1, surveyors will need to coordinate with the lead Federal agency before entering these areas, and a plover survey may be required prior to ROW demarcation. For these projects, the presence/absence guidelines above should adhere to the dates below.

1. **April 10 through July 10** - a plover survey will need to be completed 1- 3 days prior to any construction activity, including initial brush clearing, to avoid direct take of mountain plovers. The survey should include the route and a 1/4 mile buffer on either of the project corridor. If there is a break in construction activity in these areas of more than 3 days (e.g., between pipe stringing, trenching, or welding), an additional plover survey is necessary before construction activity can resume after that break in

activity. Generally, mountain plovers are either establishing territories and nests in April, and from late June to early July young chicks commonly freeze in place to avoid detection, increasing their vulnerability to direct take. After July 10, most mountain plover chicks are sufficiently mobile to reduce the risk of direct take.

2. If an active nest is found in the survey area, the planned activity should be delayed 37 days, or seven days post-hatching. If a brood of flightless chicks is observed, activities should be delayed at least seven days.

### **SURVEY TO DETERMINE DENSITY OF NESTING MOUNTAIN PLOVERS**

We are assuming people will have received training on point counts in general before using this specialized point count technique adapted to mountain plovers.

#### **Establishing Transects**

1. Identify appropriate habitat and habitat of interest within geographic areas of interest.
2. Upon arriving in appropriate habitat, drive to a previously determined random starting point.
3. For subsequent points, drive a previously determined random distance of 0.3, 0.4 or 0.5 miles.
4. Each transect of point counts should contain a minimum of 20 points.

#### **Conducting The Point Counts**

1. Conduct counts between last week in June to July 4<sup>th</sup> at elevations equivalent to the eastern plains of Colorado (i.e., about 5,000 feet). Timing of counts at other elevations should be coordinated with the local FWS office.
2. Only 1 counter is used. Do not use a counter and recorder or other combinations of field help. Drivers are okay as long as they don't help spot plovers.
3. If an adult mountain plover is observed, plot occupied territories on a minimum of 1:24,000 scale map and on a ROW diagram or site grid (see attached). The ROW diagram will be at a greater level of detail, depicting the location of breeding birds (and possible nest sites) relative to ROW centerline, construction boundary, and applicable access roads.

4. Estimate or measure distances (in meters) to all mountain plovers. Method used should be noted, e.g., estimates w/distance training, estimates w/o distance training, rangefinder or measured with tape measure, etc.
5. Record "fly-overs" as "FO" in the distance column of the data sheet.
6. If you disturb a mountain plover while approaching the point, estimate the distance from point-center to the spot from which the bird was flushed.
7. Conduct counts for 5 minutes with a 3 minute subsample to standardize with BBS.
8. Stay close to your vehicle while scanning.

## **Recording Data**

Record the following information AT EVERY POINT, EVERY DAY.

- start time
- unique point code (don't duplicate within a field crew or across dates)
- number of mountain plovers and distance to each
- land use and/or habitat type (e.g., fallow wheat, plowed, shortgrass)
- temperature, Beaufort wind, and sky conditions (clear, partly cloudy, overcast)
- Information on the data sheet somewhere.
- your name and address
- date
- Record for each point at some point during the census.
- detailed location description of each point count including road number, distance to important intersections.
- record transect and point locations on USGS county maps.
- Universal Transverse Mercator from maps or GPS are useful.



## **GENERAL HABITAT INDICATORS**

### **Positive habitat images**

Stock tank (non-leaking, leaking tanks often attract killdeer)

Flat (level or “tilted”) terrain

Burned field/prairie/pasture

Bare ground (minimum of 30 percent)

“Spaced” grass plants

Prairie dog colonies

Horned larks

Cattle

Heavily grazed pastures

*Opuntia* pads visible

### **Negative habitat images**

Killdeer present (indicating less than optimal habitat)

Hillsides or steep slope

Prominent, obvious low ridge

Leaky stock tanks

Vegetation greater than 4 inches in height in short-grass prairie habitat

Increasing presence of tall shrubs

Matted grass (i.e., minimal bare ground)

Lark buntings